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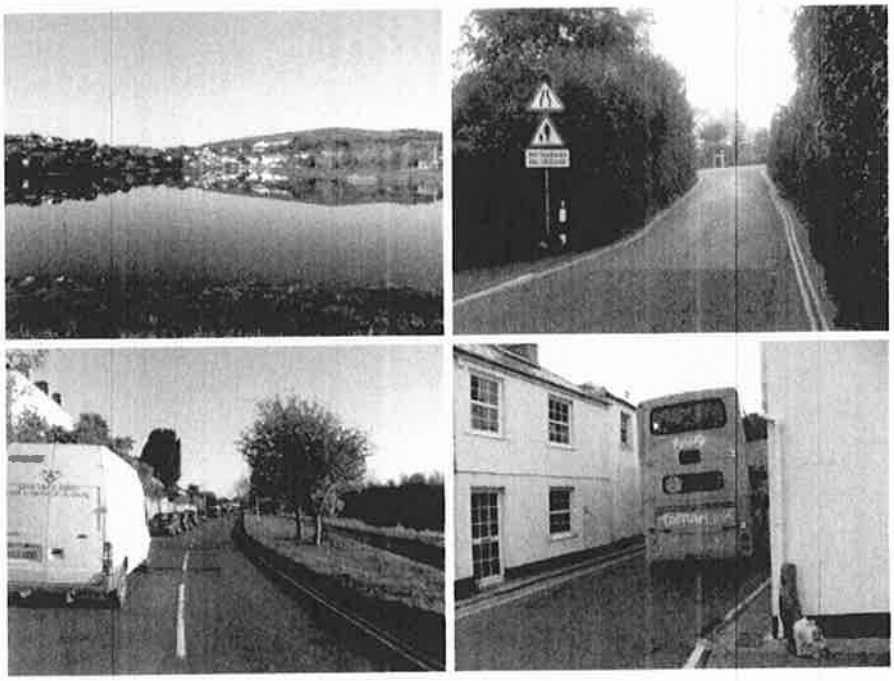
Scott Wilson

Millbrook Phase 2
Traffic Study & Transport Assessment

Report
Octber 2009



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Prepared for

Devon & Cornwall Housing Association

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Revision Schedule

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Rev	Date	Details	Prepared by	Reviewed by	Approved by
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1 Summary of the findings of the Study

1.1.1 This Summary collates the findings of the various constituents of the Study and repeats the conclusions contained within Chapter 11.

1.1.2 Using survey data from the adjoining Parsons Court development and other traffic and census data, the maximum combined peak time two-way vehicular traffic flow from the proposed development and the committed development off Insworke Close, that will travel beyond the village boundary, is confidently predicted to be no more than 15 vehicles in the morning peak hour and 23 vehicles in the evening peak hour.

1.1.3 This figure will not be reached if incoming residents of the new properties are already resident in Millbrook and the properties they vacate are filled by other existing residents.

1.1.4 The maximum flow will travel on the length of Southdown Road between Parsons Court and the mini-roundabout junction with St John's Road. Beyond this junction the traffic will begin to disperse onto the various routes out of the village.

1.1.5 While it is not possible to be certain which routes will be favoured the location of the developments combined with the surveyed traffic flow data suggests that a small number may use the route through St John, a very small number may use the route via St Andrew's Street and the remainder would use Dodbrook, West Street and Hounster Hill, together with potentially some via Anderton to Cremyll.

1.1.6 An analysis of the spare capacity of the various routes demonstrates that the major routes should be capable of carrying the whole of the development traffic should it decide to travel that way and that all routes should be capable of carrying a realistic share of the traffic.

1.1.7 This analysis has been undertaken using data from Traffic surveys undertaken in October 2009. During this period the morning peak hour traffic flows are likely to be at their highest with maximum attendance at school and work and minimum interference from adverse weather conditions. This period is considered to be the most critical of the day because of the need to rely on a 'guaranteed' journey time to arrive at school or work at a set time. Seasonal variations are likely to show a reduction rather than an increase in the level of flow measured. During the afternoon peak period it is possible that during holiday periods a reduction due to residents being on holiday may be equalled or exceeded by the added flow of visitors to the coastal villages or Mount Edgcumbe. This variation is impossible to predict, will vary daily and is of significantly less important than the critical timing situation of the morning peak. The Study is therefore considered to have been undertaken in the correct manner.

1.1.8 An analysis of the recent record of collisions on the highway resulting in personal injury reveals that there are no clusters of accidents within the village that might give cause for concern should traffic flows increase. Externally, the route through St John has a poor record in relation to the volume of traffic carried.

1.1.9 In terms of sustainability, the village as a whole has a good bus frequency, however from the point of view of the journey to and from work it is not particularly convenient, certainly for destinations other than Plymouth City Centre. This places a reliance on the use of the car for many journeys which, according to census data is tempered by the high percentage of employees reported as working from home or within the village. The site of the proposed development is well placed to make use of the bus service that is available.

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1.1.10 The site is also reasonably well placed in respect of access on foot or cycle to the wide range of local facilities on offer, including health and primary education.

1.1.11 The need has been identified for a short length of footway to be provided along Southdown Road between the junction of Parsons Court and the recreation ground.

1.1.12 A survey of the adjoining Parsons Court development confirms that the proposed car parking ratio should be sufficient.

1.1.13 The greatest impact of the proposed development is likely to be that created by the delivery of construction materials. It is suggested that the Construction Management Plan considers a restriction on the delivery of material to site prior to 9am.

1.1.14 The overall conclusion is that the proposed developments are manageable in transport terms and clearly any potential impact will be minimised if the number of new residents to the village is also minimised.

2 Introduction

2.1.1 A Traffic Study for Millbrook has been requested by Cornwall Council to provide a background against which a planning application by Devon & Cornwall Housing Association, for 22 homes can be assessed.

2.1.2 The proposed development was introduced to the Millbrook Parish Council at their meeting on 15 September 2009 and the minutes of this meeting expressed concern on the potential impact on congestion and queried the views of Cornwall Council Highways.

2.1.3 The development is planned on a greenfield site adjacent to a recently completed residential development to the south of Southdown Road, Millbrook.

2.2 Study Scope

2.2.1 At the Parish Council meeting the following areas of 'concern' were identified:

- Hounster Hill
- Dodbrook
- West Street
- St John

2.2.2 This Study will investigate these areas together with:

- King Street
- St Andrew's Street

2.2.3 The Parish Council also requested that a footway be provided in the existing verge between Parsons Court and the footpath through the Playing Field.

2.2.4 The roads to and within the village have evolved over time rather than having been planned or designed and hence it is not possible or realistic to assign a maximum capacity to them in vehicles per hour and subsequently to determine through surveys whether they are above, below or at capacity.

2.2.5 In addition, vehicles over the years have increased in size, for instance where two Mini's in the 1960's could pass in a width of 4m the people carriers of today with wide wing mirrors cannot. Buses and heavy goods vehicles have also got larger.

2.2.6 This Study therefore attempts to:

- Assess the current situation by surveying critical locations and describing how they operate.
- Provide a guide as to the number of additional vehicle movements the proposed development is likely to generate.
- Investigate the traffic routes that could experience an impact from the proposed development. The Traffic Study will also consider the movement of persons related to the proposed development by other modes of travel, i.e. the sustainability of the location.

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- Investigate records of collisions on the highway resulting in personal injury.
- Report on the feedback from consultation with a number of bodies.

2.2.7 The Study excludes consideration of other areas of the village where conditions may be considered to be less than ideal but which are expected not to be affected by the proposal under consideration.

2.3 Surveys

2.3.1 Cornwall Council advised that they did not hold any recent traffic data relevant to the area. Surveys were therefore undertaken during the period 9 to 16 October 2009.

2.3.2 The surveys were conducted at the locations indicated on Figure A.2 in the Appendix.

2.3.3 It is normal practice to undertake traffic surveys in 'neutral' months.

2.3.4 October is classed as one of the 'neutral' months for traffic surveys. It is a time of year when traffic flows are not affected by school or other holidays (apart from half term week) or abnormal weather conditions. The surveys should therefore provide a reliable indication of the situation that will normally be encountered.

2.3.5 There were no known large construction projects underway in the area that would have raised the number of Heavy Goods Vehicles (HGV's) and corresponding construction worker trips.

2.3.6 A funeral service was held in the village on the morning of 15 October; however this is unlikely to have significantly affected traffic flows. There were no known special events being held at Mount Edgcumbe apart from the Private Viewing of an exhibition of works by local artists on the afternoon of Friday 16 October by which time the surveys had been completed.

2.3.7 The surveys undertaken therefore represent the normal situation, the one that is regarded as the norm and instantly forgettable. The abnormal situations where significant delays occur due to road works, accidents, increases in the number of HGV's, weather etc, are usually remembered and these represent only a small proportion of trips in a year.

2.3.8 The surveys were restricted to weekdays as these are considered to be the most important from the viewpoint of the travelling local public and generally generate the highest number of trips from residential developments. The morning weekday trip is especially important with the need to have a reliable time for the journey to work or school.

2.3.9 The morning peak period is unlikely to be affected by seasonal traffic, other than being reduced when schools are on holiday. The evening peak may experience a change, however as explained earlier the need to get home at a particular time is likely to be less important overall than the need to get to work or school.

2.3.10 On the weekends the level of traffic flow through Millbrook will be heavily dependent on the weather and the season, being on the route to the coastal villages of Kingsand / Cawsand and the Country Park at Mount Edgcumbe. Unlike the 'neutral' weekday which will not experience much variation there will be a very wide range of conditions at weekends and no attempt has been made to either measure or predict the impact of the proposed development on Saturdays or Sundays.

3 The Proposed Development

3.1 Background

3.1.1 As a very broad generalisation, over the years residential development has taken place first in the centre of Millbrook then eastwards on the more level areas of Anderton and finally the topography has forced the recent and future developments north-westwards to Insworke and Southdown.

3.1.2 An earlier ribbon development along Southdown Road of 25 properties and local authority development of 62 properties (Insworke Close, Insworke Place, Insworke Crescent and Edgcumbe Crescent) has been enlarged by:

- 10 at Calvez Close
- 41 at Welman Road area
- 54 at Millpool Road area
- 60 at Old Chapel Way area
- 20 at Parsons Court

3.1.3 These combine with approximately 20 properties along the creek side opposite Anderton, at Foss, Silver Terrace and Elm Park, to give a total of approximately 272 residential properties served off the Southdown Road leg of the mini-roundabout junction with St Johns Road.

3.1.4 Planning permission has recently been granted for 15 residential properties in an extension of Insworke Close.

3.2 The development

3.2.1 The proposed development considered within this report consists of 22 residential dwellings. The development will be accessed off Parsons Court through a link that was designed for such an extension to be considered at a later date. The location of the development is shown on Figures A.1 and A.2 in the Appendix.

3.2.2 The development will be provided with 33 off street parking places giving a ratio of 1.5 spaces per dwelling. An additional 3 parking places will be provided to replace those provided for the earlier Parsons Court development in the space that will be occupied by the access road. The Architects drawing is included as Figure A.3 in the Appendix.

3.2.3 The design of the second phase will safeguard means of access for further phases.

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4 The Highway Network

4.1 Development of the Highway Network

4.1.1 Most of the roads to and within the village have evolved over time rather than having been planned or designed. The following is a brief history of proposals and actual changes.

4.1.2 During the Second World War houses in Dodbrook were demolished to enable access to Cremyll for American war material destined for the D-Day landing.

4.1.3 In the 1970's a proposal to construct a power station at Insworke was associated with a new road between the A374 to the west of Torpoint and the site. The road would have skirted the south of St John's Lake. The first section between the A374 and the bridge over the head of the lake was constructed by the CEGB and a reservation placed on the remainder of the route. When the power station scheme was abandoned the reservation was removed.

4.1.4 In the 1980's the route between the centre of the village and Southdown – via Newport Street – was bypassed by an extension to the Garrets (referred to as New Road). The construction of this route was facilitated by the damming of Millbrook Lake. The new road – approximately 500m in length – has a two lane width and footways on both sides.

4.1.5 Associated with this scheme the Parish Council designed and managed the provision of a new footway around the Lime Kiln corner in Lower Anderton Road linked to a footpath to enable pedestrians to avoid walking with traffic through Greenland. At the same time the off-street parking areas in the vicinity were surfaced.

4.1.6 In the 1990's a section of the B3247 between the two Poron Factories was widened to two lane width.

4.1.7 In this decade proposals were put forward for a major Marina and housing project at Southdown. After much debate this was associated with a shortened "relief road" between St John's Road and the B3247 south of the lower Poron Factory (Gallows Park). These proposals were not progressed.

4.1.8 The sharp bend in Millpool Head was replaced by a shallow bend together with a footway in association with an adjoining residential development.

4.1.9 The Parish Council provided a footway fronting the lakeside on Lower Anderton Road.

4.1.10 In the 2008 the Cornwall Council introduced a build out in Hounster Hill in conjunction with a priority system in West Street.

4.1.11 It is significant that the two widening schemes – Millpool Head and New Road - have enabled traffic speeds to increase and this is one of the concerns of the local population.

4.2 External Primary Routes

4.2.1 The external routes are shown on Figure A.1 in the Appendix.

4.2.2 Externally, Millbrook is reached primarily by the B3247 from Tregantle. Between Tregantle and the village the road has a varying width and a significant portion is not wide enough for a centre

lane although generally wide enough for two vehicles to pass. As it approaches the village (between the Millbrook Business Park and its junction with St Andrew's Street) the road runs between high hedges and has poor width and alignment.

4.2.3 At Tregantle the B3247 splits with one leg heading towards Antony, where it joins the A374 to Torpoint, and the other leg heading towards Crafthole, beyond which it joins the A374 towards Trerulefoot Roundabout and the A38.

4.2.4 As will be shown later the impact of the proposed development on these two routes is likely to be very low and hence no traffic surveys have been undertaken on them. However for completeness a commentary on the routes is given.

Antony Route

4.2.5 This route is of sufficient width for a centre line throughout. There is a steep hill out of Antony village towards Tregantle. Within the village a traffic calming scheme has been introduced with narrowings and alternating priority. Lack of forward visibility provides a significant reduction in traffic speed, well below the posted 30mph limit.

Crafthole Route

4.2.6 The route to and through Crafthole has varying width and alignment and generally does not have a centre line. Within Crafthole, narrowings, road humps, mini-roundabout and speed cushions, together with obstructive on-road parking maintain speeds at or below the posted 20mph limit. Between the village and the A374 is a long relatively steep hill.

4.3 External Secondary Routes

4.3.1 External secondary routes used are through St John, Whitsand Bay and Anderton.

St John Route

4.3.2 The route through St John is popular as it saves approximately 4 miles on the journey to Torpoint. It is very narrow with blind bends, limited opportunity to pass opposing vehicles and has steep hills. The village of St John has been traffic calmed with road humps to try to control through traffic. Recently the route via the tidal ford has also been provided with speed cushions to reduce the speed of traffic to the posted 20mph limit.

4.3.3 As a generalisation, villagers from the north-west of Millbrook (Insworke/Southdown area) will use the whole length of the route while villagers from other areas and from Kingsand / Cawsand will join the route approximately midway after turning off the B3247 at the 'Upper Poron Factory' and travelling down Mendennick Hill. The two flows then combine to travel through St John.

Whitsand Bay Route

4.3.4 The route via Whitsand Bay turns off the B3247 at Tregantle and after following Military Road passes through Kingsand/Cawsand and rejoins the B3247 at Fourlanesend. It is a bus route and generally narrow.

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Anderton Route

4.3.5 Residents of Southdown heading for the pedestrian ferry at Cremyll would take the Anderton Route. Beyond the village this follows the creek side, rises up towards Mount Edgcumbe, joins the B3247 at Home Farm and then descends to Cremyll. Virtually the entire route is of insufficient width for a centre line.

4.4 Internal Highway Network

4.4.1 The internal routes are shown on Figure A.2 in the Appendix.

Hounster Hill

4.4.2 From the north on the B3247, the village sign and 30mph speed limit signs are located on Hounster Hill just to the north of its junction with St Andrew's Street.

4.4.3 The road descends around a blind 90 degree left hand bend. On this bend the carriageway width is approximately 4.5m and two large vehicles cannot pass each other. A view looking uphill out of the village is shown in **Figure 4.1.**

Figure 4.1: Hounster Hill looking west

4.4.4 Prior to the junction with Radford Lane the Highway Authority has recently installed a build out with a priority system at which inbound traffic has to give way to outbound traffic. Views of the build out are provided **in Figures 4.2** and **4.3.**

Figure 4.2: Hounster Hill priority system

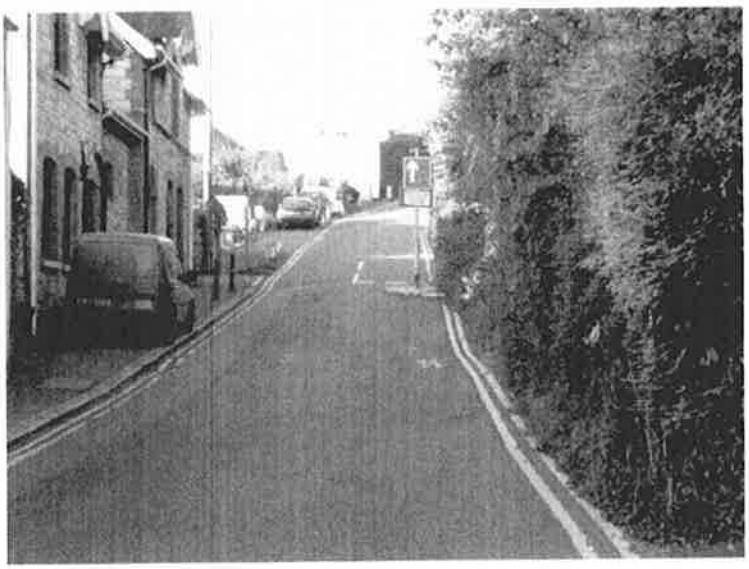

Figure 4.3: Hounster Hill priority system

4.4.5 Beyond the build out the road narrows further and drivers operate an informal give-way system.

4.4.6 This informal give-way system makes use of the widening created by the junction with Radford Lane. The limited capacity of this is shown in **Figure 4.4**.

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Figure 4.4: Westbound exit from West Street narrows

4.4.7 Because of the very acute angle of this junction, drivers wishing to exit Radford Lane have no visibility of vehicles approaching down Hounster Hill without pulling forward significantly over the give-way line.

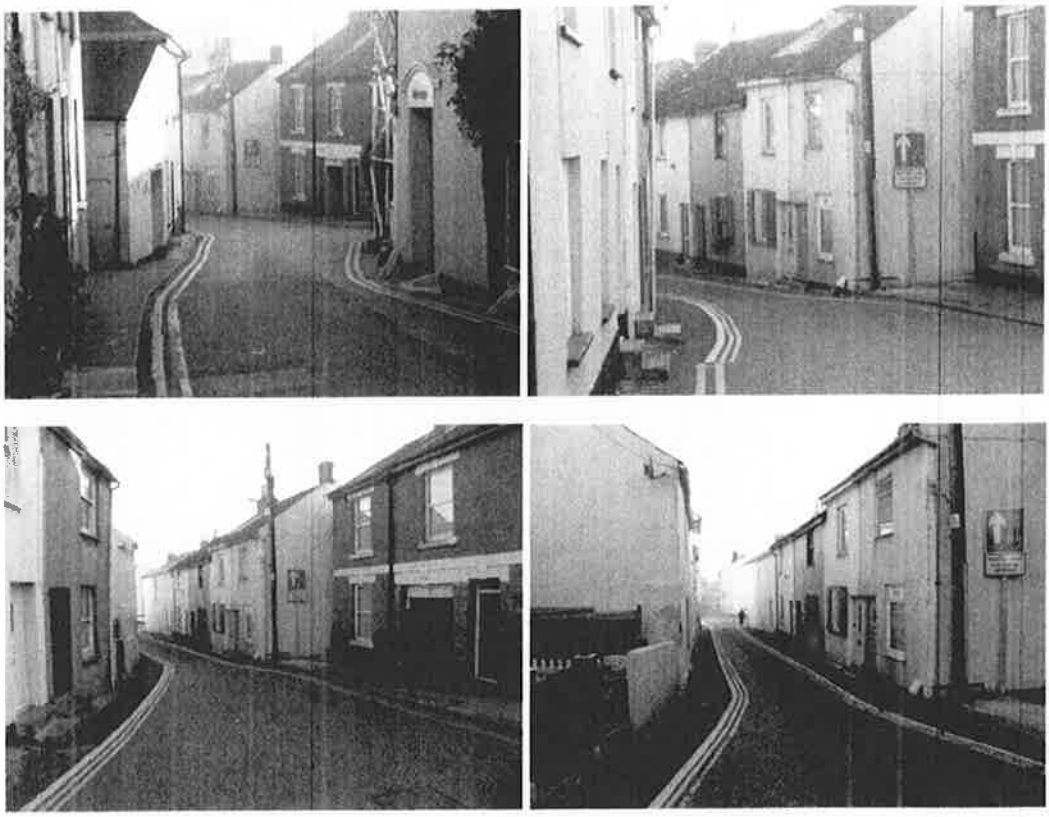
4.4.8 At this junction Hounster Hill joins West Street.

West Street (west)

4.4.9 This section of West Street passes between residential properties whose doorways open directly onto the highway. At its eastern end the carriageway is approximately 4m wide and insufficient for two vehicles to pass.

4.4.10 As a result of a Parish Council request, Cornwall Council recently replaced an 'informal' give way system with a 'formal' system with priority given to inbound vehicles. A 2.3m wide vehicular carriageway is marked through the centre of this section with red surface dressing strips either side behind a solid white line. The side strips have a minimum width of 0.6m and are designed to accord pedestrians with a degree of protection.

4.4.11 Approaching this priority system from Hounster Hill the road alignment is such that it is not possible for a driver to see if it is already occupied and on occasions there will be a need to reverse. This is shown in **Figures 4.5 to 4.8**.



Figures 4.5-4.8: Eastbound driver's view approaching West Street narrows

4.4.12 Approaching this system from Dodbrook the Cornwall Council have placed a give-way marking across Dodbrook in addition to the give-way marking controlling access from West Street (east). From the former give-way marking it is impossible for a driver to see whether it is clear to proceed and hence the driver needs to pull forward and then reverse if required. This is shown in **Figures 4.9** and **4.10**.

Figures 4.9 and 4.10: Driver's view approaching West Street narrows from Dodbrook

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4.4.13 A yellow box road marking has been installed to enable the vehicle to reverse. Drivers in vehicles waiting at the West Street (east) give-way marking have good visibility in all directions as shown in **Figures 4.11** and **4.12**.

Figures 4.11 and 4.12: Driver's view from West Street (east)

Dodbrook

4.4.14 Previously buses stopped in both directions in the section of road immediately to the south of West Street. This activity obstructed through traffic. This source of congestion has been removed as buses no longer travel on this route. There is then a short pinch point beyond which the carriageway widens at the access to the main car park for the village. Cornwall Council has placed a 'no waiting restriction' traffic regulation order (TRO) in this area and this has removed another source of congestion.

4.4.15 The road then narrows to a single lane width between high hedges. On this section warning signs of 'road narrows' and 'pedestrians in the road' have been erected and it is believed that the Parish Council are asking for this section to be treated in a similar fashion to West Street. The width is approximately 4.0m and the length of this section approximately 31m. A view of this section is shown in **Figure 4.13**.

Figure 4.13: View of the Dodbrook narrows looking south

4.4.16 The road then widens for a short length sufficient for two vehicles to pass, then narrows again for a distance of 56m to a width of 4.5m between a high stone wall and stone hedgebank. This section of road can accommodate two cars but not a car and a larger vehicle, an HGV for example. The approach to this section from the south is shown in **Figure 4.14**.

Figure 4.14: Approach to Dodbrook from the south

4.4.17 It possible for drivers to see from one end of each of the narrow sections to the other end of that section but not to see from the start of one section to the end of the other. The two sections are therefore negotiated independently.

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4.4.18 Beyond the second narrow section the road widens for the junction with Millpool Head and has a footway on the village side, as shown in **Figure 4.14.**

Millpool Head

4.4.19 The radius of the left turn into Millpool Head and the following left hand bend have been eased by Cornwall Council in association with an adjoining residential development. This is shown in **Figure 4.15.**

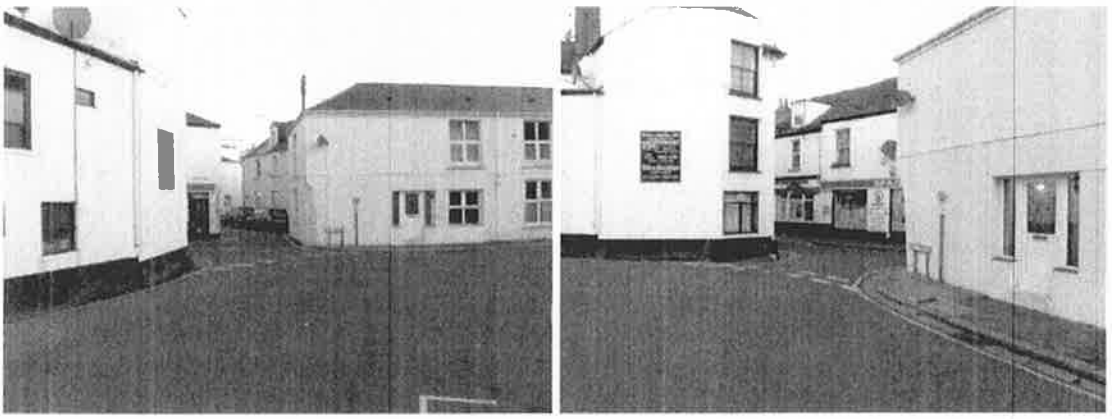
Figure 4.15: Millpool Head approach to the village centre

4.4.20 One impact of this has been to increase the speed of traffic towards the centre of the village. The footway from Dodbrook continues on the west side of Millpool Head and then crosses to the other side as the road approaches King Street.

4.4.21 Millpool Head forms part of the pedestrian route to the primary school at Fourlanesend. Pedestrians have to cross to the west side where there is no footway and walk in the road around the corner of the Burial Ground. At the priority junction with Dodbrook, emerging drivers have very restricted visibility of vehicles approaching from Four Lanes End as shown in **Figure 4.16.**

Figure 4.16: Exit from Millpool Head onto B3247 at Dodbrook

4.4.22 Continuing into the village, Millpool Head ends at its junction with Fore Street, West Street (east) and King Street. The views into Fore Street / West Street from Millpool Head and King Street are shown in **Figures 4.17** and **4.18**.



Figures 4.17 and 4.18: Views of Millpool Head / King Street junction

Fore Street

4.4.23 Fore Street faces Millpool Head and drivers emerge with no visibility into King Street as shown in **Figure 4.19**.

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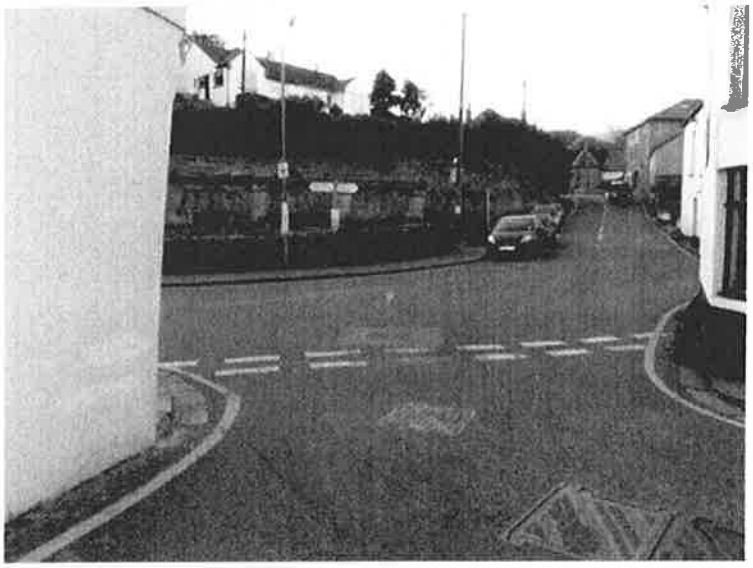

Figure 4.19: Exit from Fore Street into Millpool Head

West Street (east)

4.4.24 West Street (east) is a one-way street leading away from the junction with Millpool Head.

4.4.25 West Street (east) is used as one of the main exit routes from the village as it has a shorter distance than using Millpool Head and Dodbrook and provides an easier entry into the West Street (west) narrows.

4.4.26 It is also the principal retail street of the village. The first section is of single lane width. Where it widens a loading bay has been marked on the carriageway as shown in **Figure 4.20**.

Figure 4.20: Eastern end of West Street (east)

4.4.27 On the occasions when cars park in this bay, particularly overnight, the larger delivery vehicles will have to wait in the narrow section to off load. When this occurs vehicles turning into West Street have to reverse out.

4.4.28 Further on the road widens and on-street parking is permitted. Abuse of waiting restrictions and generally obstructive parking has been observed along this section.

4.4.29 Beyond the entry/exit of the main village car park (pay & display) the road narrows again to a single lane width.

King Street

4.4.30 King Street is a short length of road linking Millpool Head to The Parade / New Road. It essentially forms a straight section in the middle of an 'S' bend. It an attempt to relieve congestion Cornwall Council have amended the waiting regulations to permit short term waiting where appropriate and prohibit it on the apex of the corner between Millpool Head and King Street. It has been observed that this prohibition is regularly ignored.

4.4.31 Site observations have revealed that drivers approaching from Millpool Head frequently give priority to opposing drivers turning into West Street (west) in order to relieve congestion.

4.4.32 At the eastern end of King Street is a blind right angle corner into The Parade. On this corner is the junction with Workhouse Hill, seen as the road leading ahead in **Figure 4.21**.

Figure 4.21: King Street approach to The Parade

4.4.33 At this junction the shortage of visibility results leads to drivers having to stop or reverse to enable opposing vehicles to pass. This is particularly the case when buses or larger vehicles are turning. A bus turning into The Parade is shown in **Figure 4.22.**

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Figure 4.22: Bus turning from King Street into The Parade

The Parade / New Road

4.4.34 The Parade contains a petrol filling station and a garage.

4.4.35 As previously outlined the New Road was created by improving and extending The Garrets towards Southdown Road. The road has a 2 lane width with a prohibition on waiting along the whole length of the lake side and a similar prohibition in sections on the opposite side in order to enable a flow of traffic as shown in **Figure 4.23**.

Figure 4.23: New Road

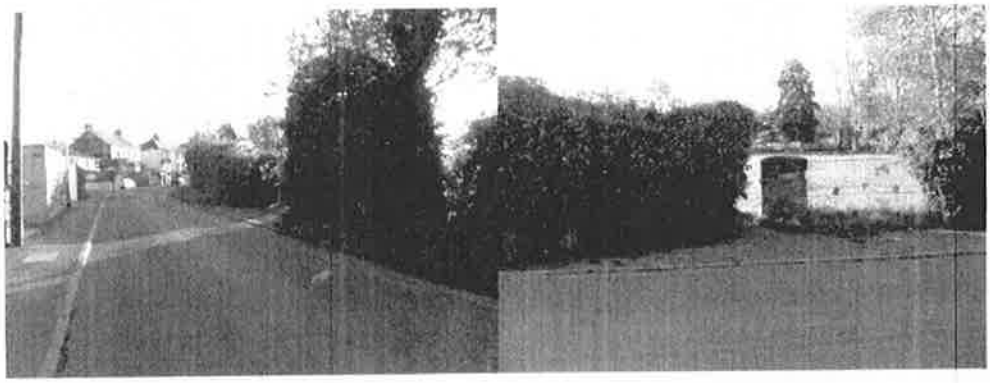
4.4.36 This road possibly provides the main source of complaints with regard to speeding traffic.

4.4.37 Conversely complaints are made that the parking inhibits the free flow of traffic; however for most considerate drivers it probably reduces traffic speeds without the need to resort to road humps etc.

4.4.38 The New Road joins Southdown Road at a mini-roundabout junction with St John's Road.

Southdown Road

4.4.39 Southdown Road is of adequate width for two-way traffic but does not have a centre line. To the south side is an access to the recreational area with a locked vehicular access for maintenance vehicles and a separate pedestrian gate as shown in **Figures 4.24 and 4.25.**



Figures 4.24 and 4.25: Access to recreational area on Southdown Road

4.4.40 This recreational area has a number of other accesses and therefore this particular access is likely to be used mainly by children form the Old Chapel Way estate.

4.4.41 As well as the Southdown housing area, Southdown Road provides access to the football club and marina / boatyard facilities. It is a cul-de-sac.

St John's Road

4.4.42 The first section of St John's Road between Southdown Road and Newport Street is just of sufficient width for parking on one side and a single lane of traffic in one direction at a time. Beyond Newport Street to its junction with Blindwell Hill the road has a centre line.

Newport Street

4.4.43 Newport Street is a narrow road with a limited number of opportunities to pass opposing vehicles. It has generally been bypassed with the construction of the New Road; however it provides a direct route between Southdown and St Andrew's Street.

St Andrew's Street

4.4.44 Newport Street leads into St Andrew's Street at the junction with Blindwell Hill and Fore Street. For a distance of 516m between this junction and its junction with Hounster Drive it is mostly of single lane width narrowing to 2.5m between Cornish hedges. The one significant wider section

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is used for parking by local residents. It has been traffic calmed with road humps and speed cushions.

4.4.45 The traffic calming continues in the 108m length between the Hounster Drive junction and its junction with Hounster Hill. This section of road is capable of carrying two-way traffic.

4.5 Car parking

4.5.1 Many of the older properties in the village have no or insufficient off-street parking. As a result a significant amount of residential on-street parking takes place wherever the roads are wide enough or parking is not controlled. Obstruction parking on restricted areas can also be observed.

4.5.2 The main off street car park lies behind West Street (west) and is a Pay & Display car park operated by Cornwall Council. Local residents are able to purchase season tickets. It has a capacity of 64 + 2 disabled + 1 motor cycle spaces.

4.5.3 The second car park is accessed off The Parade. This is owned by the Parish Council and free to use. It is unmarked and has a capacity of approximately 33 spaces without obstructing access to private garages and forecourts. This car park contains the only cycle parking rack in the village.

4.5.4 There are two parking areas either side of the Doctor's Surgery. These are owned by the Parish Council and free to use. Their capacity is approximately 12 vehicles.

Parsons Court

4.5.5 A survey of parking in Parsons Court was undertaken at 10.30pm on Sunday 11 October 2009 to check the adequacy of provision. Associated with the 20 properties were 25 vehicles, indicating a ratio of 1.25 per dwelling – below the 1.5 provided. A similar ratio is proposed for the new development.

5 Consultation

5.1.1 Consultation has been undertaken with a number of organisations with an interest in the traffic situation in the Millbrook area.

Cornwall Council

5.1.2 Rebecka Dickson has confirmed that the Cornwall Council has no scheme of works outstanding for Millbrook. She advised that the Parish Council had requested that a 20mph speed limit be applied.

5.1.3 Although not mentioned, it is understood that proposals have been put forward by Cornwall Council for the erection of bollards in the footway of the one-way section of West Street to control pavement parking.

Devon & Cornwall Police

5.1.4 PC Pat Libby reported that common themes of complaints or comments to them relate to speeding within the village and the continual development at Southdown which is perceived to add to traffic volumes.

First Devon & Cornwall

5.1.5 Simon Newport, Commercial Director, commented that the main problem was the road along Hounster Hill (B3247). As a result of the overhanging buildings the vehicles find it extremely difficult to get through with oncoming traffic in the opposite direction. He wondered whether it would be possible to consider a set of traffic lights along this section and one-way working such as in Lyme Regis, Dorset. This would allow the vehicles to use the entire width of the wrong side of the road. At the same time all parking would need to be removed.

5.1.6 Simon confirmed that the above difficulty in using West Street / Hounster Hill contributed to the recent decision to withdraw buses from that route and route them via Whitsand Bay.

5.1.7 Simon commented that the same problem occurs when travelling down Millpool Head on to King Street and that a similar solution may alleviate the problem there.

A Line Coaches

5.1.8 Jim Goddard commented that as he runs smaller buses he does not experience problems to the same extent as First Devon & Cornwall. He appreciates that further development will add to traffic flows through the village and St John and his drivers will have to deal with this. He views further development as an opportunity to carry a greater number of passengers.

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6 Highway Safety

6.1.1 The records of collisions on the highway resulting in personal injury, on the routes to and within the village, for the last 3 complete three year period 1/7/2006 to 30/6/2009, have been obtained from Cornwall Council. The ones relevant to this Study have been abstracted in the analysis.

6.1.2 The area of search is indicated in **Figure 6.1.**

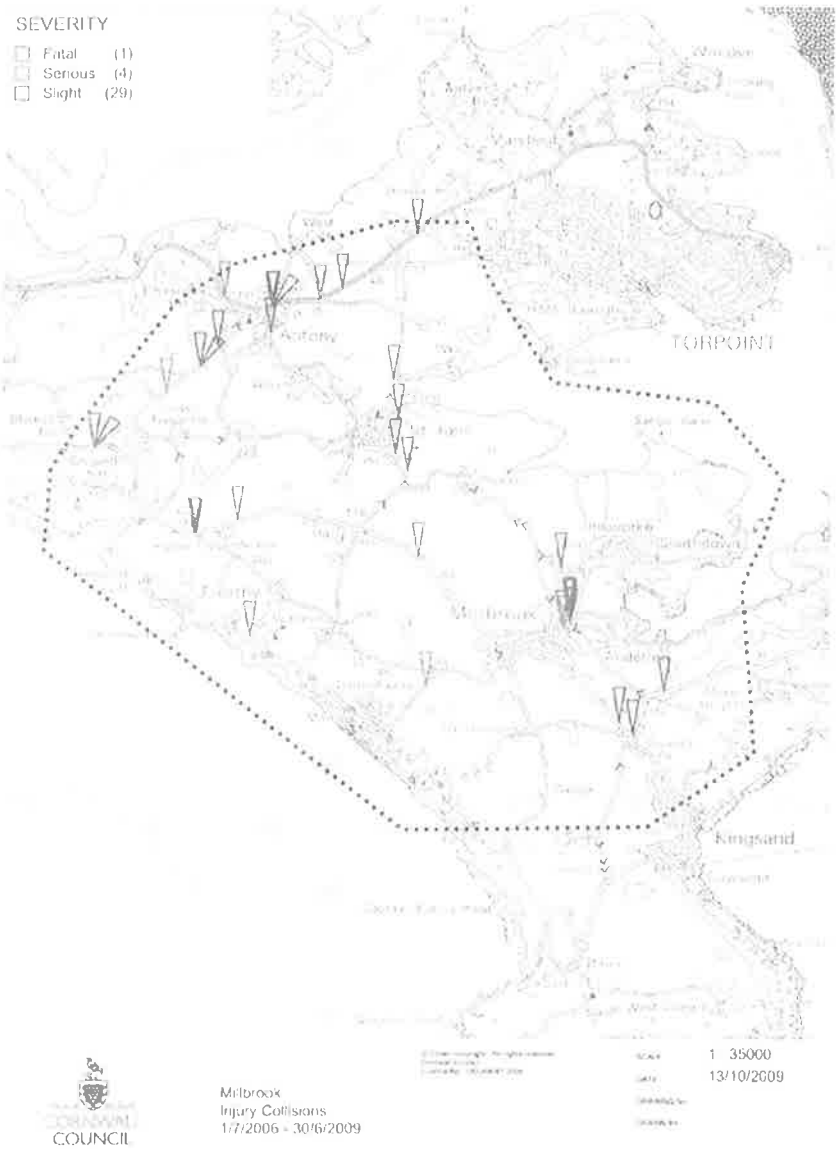

Figure 6.1: Map of collisions resulting in personal injury

6.1.3 From inspection of the written text there appears some doubt as to whether the locations highlighted in the Figure are completely accurate and this may be due to mis-recording of the co-ordinates of the collision. In the analysis the text has been used.

Collisions in the village

The Parade

- Child playing ran into a car
- Car reversing to allow a bus to proceed collided with car behind it

King Street

- Single vehicle lost control and collided with a building

New Street (possibly New Road)

- Car reversed into pedestrian waiting to cross road
- Motor cycle ran into the back of a car that allegedly suddenly braked

Dodbrook (Manor Farm)

- Car pulled out of a junction into path of motor cycle

Collisions outside the village

B3247 Tregantle to Millbrook

- Single vehicle left the road on bend in thick fog
- Collision between car emerging from Higher Tregantle Farm and car on B3247
- Head-on collision between a light goods vehicle and a car in a narrow section close to Higher Tregantle Farm
- Collision between car emerging from farm shop and a car on B3247

Route through St John

- Head-on collision in narrow lane
- Head-on collision in narrow lane
- Head-on collision in narrow lane
- Van reverses to allow oncoming traffic to pass and collides motor cycle behind it

6.1.4 All collisions resulted in Slight Injuries apart from the single vehicle collision in King Street which resulted in a Serious Injury.

6.1.5 With approximately the last 10 years there have been at least 2 fatal collisions on the B3247, one involving a pedestrian in the narrow section between the Millbrook Business Park and Hounster Hill and one involving a heavy goods vehicle in the narrow section to the east of Higher Tregantle Farm.

Comment

6.1.6 The collision record within the village does not indicate any particular area where there is cause for concern, apart from possibly New Street (or New Road). If it is New Road then it indicates

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that improving roads up to modern day standards does not necessarily increase safety. Conversely where conditions make all road users take care, while they may appear unsafe, the apparently poor conditions by their very nature promote safety.

6.1.7 The areas of the village without apparently adequate footway provision, for instance Dodbrook, West Street, Hounster Hill, King Street, Millpool Head, while although not ideal do not have a poor road safety record. There is no reason to suppose that the slight increase in traffic flow associated with the proposed developments would lead to decrease in safety for vulnerable road users.

6.1.8 The record indicates that while measures have been put in place in Hounster Hill and West Street there may not have been an underlying collision problem there.

6.1.9 Externally, it is significant that the route through St John has experienced the same number of collisions resulting in injury as the route via the B3247 while it is carrying a very much lower volume of traffic. An increase in traffic on this route could be a cause for concern for residents of that village as they have to use the roads in and out.

7 Sustainability

7.1.1 The analysis of sustainability will consider accessibility to employment and local facilities. It will also consider the role currently and potentially played by sustainable modes of travel.

Employment

7.1.2 An assessment of the existing residential travel to work trips has been undertaken for the Millbrook Ward to ascertain the locations where existing Millbrook residents travel to work, and what mode of transport they use.

7.1.3 The Census 2001 database has been interrogated to obtain travel to work data for Millbrook residents. The employment destinations have been categorised into the following classifications:

- Millbrook
- Plymouth City Centre (St Peter and The Waterfront Ward only)
- Plymouth City boundary (All Plymouth Wards excluding St Peter and The Waterfront)
- Torpoint (Torpoint East and Torpoint West Wards)
- Rame
- Other (All other wards not included in the preceding categories)

7.1.4 The number of residents travelling to work to each employment location category is summarised in **Table 7.1.**

Employment Destination	Person Trips (Number)	Person Trips (%)
Millbrook	246	28%
Plymouth City Centre	105	12%
Plymouth City Boundary	195	23%
Torpoint	71	8%
Rame	80	9%
Other	169	20%
Total	866	100%

Table 7.1: Millbrook Ward Resident place of Employment locations

7.1.7 **Table 7.1** indicates that 28% of Millbrook residents are employed within Millbrook and 8% and 9% of residents are employed in the respective local areas of Torpoint and Rame. Employment destinations located at greater distances from Millbrook include the Plymouth City Centre and Plymouth City Boundary which account for 12% and 23% of employment trips respectively. The remaining employment destinations are located at various other locations which account for 20% of Millbrook residents work based trips.

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7.1.8 An analysis of the Millbrook residents' work trips to each employment destination category was undertaken to assess the proportions of the modes of transport used to travel to each destination. **Table 7.2** summarises the proportion of each mode used for work trips from Millbrook to each destination.

Ward	Mode Share for each Origin Ward								
	Works from home	Bus	Taxi	Car driver	Car passenger	Motor cycle	Bicycle	On foot	Other
Millbrook	40%	1%	1%	28%	2%	0%	2%	24%	1%
Plymouth City Centre	0%	20%	0%	44%	7%	8%	7%	6%	10%
Plymouth Other	0%	8%	0%	66%	6%	11%	6%	0%	3%
Torpoint	0%	0%	0%	83%	8%	4%	0%	4%	0%
Rame	0%	8%	8%	56%	19%	6%	4%	0%	0%
Other	0%	2%	0%	79%	4%	2%	0%	12%	2%

Table 7.2: Millbrook Travel to Work mode share for each destination

7.1.9 **Table 7.2** indicates that of the residents that work within Millbrook, 40% work from home, 28% travel by car and 24% travel to work on foot.

7.1.10 This examination of census data, although slightly out of date, indicates the significant degree of internalisation of trip related to employment, i.e. those taking place during commuting hours. It is therefore realistic to assume that a significant number of peak time trips from the proposed development will remain within the village.

Local facilities

7.1.11 Millbrook has a wide range of facilities.

Health

7.1.12 There is a Doctor's Surgery 625m from Parsons Court and a Chemist at 800m walking distance.

Retail / Service

7.1.13 Millbrook has a good range of retail outlets, also at 800m+ walk from Parsons Court including:

- Post Office
- Grocers / convenience stores – SPAR, COOP
- Greengrocer
- Newsagent
- Hardware store

7.1.14 Other facilities include:

- Estate Agent
- Hairdresser
- Restaurant/Fish & Chip takeaway
- Body Therapy unit
- Petrol Filling Station / car wash
- 3 motor repair garages

Education

7.1.15 A 'Sure Start' centre is located at the football club – 260m form Parsons Court

7.1.16 Millbrook is served by 2 primary schools:

- Millbrook C of E School, Blindwell Hill – 600m walk from Parsons Court
- Fourlanesend Community Primary School – 2km

7.1.17 Secondary schooling is primarily provided the Community School in Torpoint. School buses run from the bus stop at Southdown – 150m walk from Parsons Court.

Social

7.1.18 There is a recreational area approximately 100m from Parsons Court. This contains football pitches, tennis court, children's play area and skateboard park. A second children's play area is adjacent to the main car park in the centre of the village.

7.1.19 Other social and spiritual facilities include:

- Parish Church
- Methodist Church & church hall
- Village hall
- Scout Hall
- Masonic Hall
- Billiards and snooker hall
- Football & Social club
- 3 public houses

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Sustainable travel

Public Transport – to Plymouth direct

7.1.20 The nearest bus stop to the proposed development is at the junction of Southdown Road with Millpool Road at a distance of 148m. The bus stop has a shelter.

7.1.21 Services from this stop run to Plymouth and Cremyll and are provided by First Devon & Cornwall and A-Line Travel.

7.1.22 The First D&C service to Plymouth operates via Whitsand Bay and has a journey time of 83 minutes with an adult return fare of £3.75. This can reduce to approximately £3.40 with a monthly ticket and approximately £3.08 with a 3 monthly ticket.

7.1.23 The bus has priority access onto the Torpoint Ferry which provides a reasonably reliable journey time.

7.1.24 The equivalent journey time for a car trip to the City Centre from Southdown, using the B3274 via Tregantle would be approximately 40 minutes, providing there was no queue at the ferry.

7.1.25 Within Plymouth the service calls at the main railway station and Royal Parade. Some services continue to Derriford Hospital. The route therefore does not serve the main employment areas well and a change of bus would be required.

7.1.26 In addition there is only one service that can be used by employees wishing to reach work by 9am. This leaves Southdown at 06.56, arrives at Royal Parade at 08.17 and Derriford Hospital at 08.44.

7.1.27 In the evening there are two services at 'conventional' commuting times. The first leaves Royal Parade at 16.34 and arrives at Southdown at 17.52. The second leaves Derriford Hospital at 17.08, Royal Parade at 17.35 and arrives at Southdown at 19.05.

7.1.28 A survey of the use of the 06.56 service was undertaken on Wednesday 14 October 2009.

- 2 passengers boarded in The Parade (eastbound)
- 3 passengers boarded at Southdown, of which
- 2 passengers subsequently alighted at The Parade
- 2 passengers boarded at The Parade (westbound)

7.1.29 This indicates that this service is being used for local trips and is not conveying commuters in any number from the Southdown area to Plymouth.

7.1.30 The A-Line service to Plymouth operates outside peak hours and travels via Hounster Hill.

Public Transport – to Plymouth via Cremyll

7.1.31 This route is served by both First D&C and A-Line.

7.1.32 A-Line connect to the 06.50, 07.30, 08.15 and 9.00 ferries. First D&C provide a service that collects passengers from the 07.45 ferry from Plymouth and hence arrives early for the 08.15 ferry from Cremyll.

7.1.33 The survey on Wednesday 14 October revealed the following:

7.1.34 A-Line bus for the 07.30 ferry was carrying 6 passengers on arrival at Southdown, 1 alighted at Southdown, none boarded at Southdown and none boarded at The Parade.

7.1.35 First D&C bus for the 08.15 ferry was empty on arrival at Southdown, none boarded at Southdown or The Parade.

7.1.36 A-Line bus for the 08.15 ferry was carrying 2 passengers on arrival at Southdown, none alighted or boarded at Southdown, 1 boarded at New Road and 4 boarded at The Parade.

7.1.37 The above indicates that very little use is made of public transport to link to the Cremyll Ferry for access to employment in Plymouth.

7.1.38 The number of bus passengers was also noted during the King Street / The Parade survey and the results are contained within **Tables 7.3 and 7.4.**

Time	To The Parade	Number of passengers	From The Parade	Number of passengers
7.00-7.15	A Line	0		
7.30-7.15	First	0	First	0
7.45-8.00	A Line First	1 0		
8.00-8.15	First First	0 1		
8.15-8.30			First	0
8.30-8.45	A Line	2		
9.00-9.15	First	0	First	8
9.15-9.30	A Line First	2 0	A Line	9

Table 7.3: Morning Survey of bus passengers in King Street 16 October 2009

Time	To The Parade	Number of passengers	From The Parade	Number of passengers
3.00-3.15			A Line	0
3.15-3.30			First	5
3.45-4.00			A Line	0
4.00-4.15			First	0
4.15-4.30	First	1		
4.30-4.45			First A Line	2 5
4.45-5.00	First	8	First	6
5.15-5.30			A Line	2
5.30-5.45	First	0		
5.45-6.00	First	4	First A Line	0 1

Table 7.4: Afternoon survey of bus passengers in King Street 15 October 2009

7.1.39 In the midday, First D&C has recently amended the services leaving Cremyll at 12.05 and 13.05 ferries in that they no longer call at Millbrook and any passengers would have to alight at Fourlanesend and walk 0.8 miles to the centre of the village or 1.3 miles to Southdown.

7.1.40 In the afternoon First D&C connect with the 5.25 and 6.00 ferries from Plymouth. A-Line connect with the 4.15, 4.45, 5.25, 6.00 and 6.30 ferries from Plymouth.

7.1.41 The First D&C adult fare to Cremyll is £2.25.

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7.1.42 A-Line have single adult fares of £1.75 and a multi-ticket offering a reduction on this fare.

7.1.43 The Cremyll Ferry fare is £1.50 each way, reduced to £1.00 for season ticket holders.

7.1.44 Several years ago combined tickets were introduced:

- The Rame Rider combining a First D&C journey to Cremyll, the ferry journey and a Plymouth Citybus journey to the City Centre – this has been withdrawn by First D&C apparently through lack of use.
- The Ferry Rider combining the ferry journey with a Plymouth Citybus journey to the City Centre – currently £3.00.

7.1.45 The journey time to the City Centre of a combined trip is approximately 35 minutes.

7.1.46 On the Plymouth side of the ferry a bus service is also available to Derriford Hospital.

Cycling

7.1.47 Very few cyclists were identified during the traffic surveys. This is likely to be due to the relative remoteness of the village, the steep hills that have to be negotiated in all directions.

7.1.48 Between the proposed development and the facilities in the centre of the village the route for cyclists would be nearly all on the level and this mode of travel should be encouraged for these short trips to reduce parking congestion.

Walking

7.1.49 The greater part of the pedestrian route to the facilities in the centre of the village is attractive, passing through the recreational area and walking alongside the lake. The Parish Council has identified a 'missing link', being a lack of footway between Parsons Court and the recreational area. Along this length is a wide grass verge and pedestrians are forced to walk in the road or cross the road twice. The length of footway required is approximately 62m. This is shown in **Figure 7.1**.

Figure 7.1: Grass verge between Parsons Court and recreation area

7.1.50 It is understood that the ownership of the verge is being investigated to determine its availability.

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8 Trip Generation

Introduction

8.1.1 The traditional method of estimating the potential trip generation of a proposed development is to make use of the TRICs database.

8.1.2 The TRICs database contains information and traffic count data for a large number of individual developments across a wide range of land use categories. This industry standard database is regularly used by transport planners.

8.1.3 The problem with using this method for the proposed development in Millbrook, is that there will be very few, if any, perfect matches for the site in terms of size, location, proximity to other urban areas and all of the other factors that need to be taken into account.

8.1.4 In order therefore to provide a robust prediction of the potential trip generation of the proposed development it was decided to determine this by undertaking local surveys.

Parsons Court Surveys

8.1.5 In order to predict the potential trip generation from the proposed development a modal survey was carried out on the Parsons Court development on Friday 9th October 2009. The weather was overcast and raining.

8.1.6 This development will be of approximately the same size, type and location as the proposal and hence it is realistic to assume that it will have the same travel characteristics.

8.1.7 The results of the survey are shown in **Tables 8.1 and 8.2**.

Time	Vehicles out right	Vehicles out left	Vehicles in right	Vehicles in left	Pedestrians in	Pedestrians out
7.00-7.15						1L
7.15-7.30						
7.30-7.45						
7.45-8.00		2 cars		1		1R
8.00-8.15			1		1L, 1R	2R
8.15-8.30		4 cars	1			
8.30-8.45		1car				10L
8.45-9.00		2 cars, 1 p/c			1L	
9.00-9.15	1					
9.15-9.30		1				
9.30-9.45		1			1R	
9.45-10.00		1				2L

Table 8.1: Parsons Court morning access survey – Friday 9 October 2009

Key: Car – includes light vans; p/c – pedal cycle; 1L – one pedestrian making a left turn

Time	Vehicles out right	Vehicles out left	Vehicles in right	Vehicles in left	Pedestrians in	Pedestrians out
3.00-3.15		1 car	1 car		4R	
3.15-3.30	1 car		4 cars, 1 p/c	1 car	6R	
3.30-3.45		1 car	1 car			
3.45-4.00			1 car		2L	
4.00-4.15	2 cars		3 cars			
4.15-4.30		2 cars	1 car		1R	1L
4.30-4.45		2 cars	3 cars	1 car		
4.45-5.00	1 car	1 car				
5.00-5.15		2 cars	1 car			
5.15-5.30		3 cars	1 car		1L	
5.30-5.45		1 car	1 car			1L, 1R
5.45-6.00		1 car	3 cars		1L, 1R	

Table 8.2: Parsons Court afternoon access survey – Friday 9 October 2009

Key: Car – includes light vans; p/c – pedal cycle; 1L – one pedestrian making a left turn; 2R – 2 pedestrians making a right turn

Survey analysis

8.1.8 During the morning 3 hours (7-10am) a total of 13 motor vehicles and 1 pedal cycle turned out of Parsons Court – all but one turned left towards the village. During this period 3 vehicles turned into the Court, 2 from the village and one from Southdown. Twenty pedestrian movements were observed.

8.1.9 The peak hour was 8.00-9.00, with 9 motor vehicles and 1 pedal cycle.

8.1.10 The results expressed as trip rates per dwelling per hour are shown in **Table 8.3.**

Hour	Vehicle arrival trip rate	Vehicle departure trip rate	Total vehicle trip rate	Pedestrian trip rate
7.00-8.00	0.15	0.10	0.25	0.1
8.00-9.00	0.10	0.35	0.45	0.75
9.00-10.00	0.20	0.20	0.4	0.15

Table 8.3: Parsons Court morning survey Trip Rates

8.1.11 During the afternoon 3 hours (3-6pm) a total of 22 motor vehicles turned out of Parsons Court – 18 of them turning left towards the village. During this period 21 motor vehicles and 1 pedal cycle turned into the Court, all but 2 motor vehicles came from the village. Nineteen pedestrian movements were observed.

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8.1.12 The peak hour was 4.00-5.00, with 16 motor vehicles.

Hour	Vehicle arrival trip rate	Vehicle departure trip rate	Total vehicle trip rate	Pedestrian trip rate
3.00-4.00	0.4	0.15	0.55	0.60
4.00-5.00	0.4	0.4	0.8	0.1
5.00-6.00	0.3	0.35	0.65	0.25

Table 8.4: Parsons Court afternoon survey Trip Rates

8.1.13 The above table again reveals that half of the trips in the evening peak hour departed Parsons Court, again suggesting that a high proportion of trips are locally based.

Southdown Road Surveys

8.1.14 At the same time a survey was undertaken of the traffic flow associated with the rest of the Insworke/Southdown area to the east of Parsons Court as a means of checking the validity of the assumption that the parsons Court trip rates are realistic.

8.1.15 The results of the survey are shown in **Tables 8.5 and 8.6.**

Time	Vehicles towards village	Vehicles away from village	Pedestrians towards village	Pedestrians away from village
7.00-7.15		11 cars	1	
7.15-7.30	1 car, 1 bus	5 cars, 1 bus, 1 p/c		
7.30-7.45	6 cars, 1 bus, 1 hgv	11 cars, 1 bus, 1 p/c, 1 m/c	2	
7.45-8.00	9 cars, 1 bus	11 cars, 1 bus, 2 minibuses	3	2
8.00-8.15	7 cars, 2 buses, 1 hgv	9 cars, 3 buses	1	
8.15-8.30	7 cars, 1 bus	16 cars, 1 bus	7	2
8.30-8.45	4 cars 1 bus, 1 lgv	20 cars, 1 bus, 1 m/c	13	1
8.45-9.00	10 cars, 1 lgv	16 cars	2	
9.00-9.15	11 cars, 1 bus	14 cars, 1 bus		3
9.15-9.30	11 cars, 2 buses	12 cars, 2 buses, 1 m/c	2	1
9.30-9.45	5 cars, 1 lgv, 1 minibus	11 cars	1	1
9.45-10.00	11 cars	13 cars, 1 lgv	3	1

Table 8.5: Southdown Road at Parsons Court morning survey – Friday 9 October 2009

Time	Vehicles towards village	Vehicles away from village	Pedestrians towards village	Pedestrians away from village
3.00-3.15	15 cars, 2 buses	19 cars, 1 bus, 1 m/c, 1 p/c	2	
3.15-3.30	9 cars, 1 m/c	13 cars, 1 m/c	9	
3.30-3.45	7 cars, 1 bus, 1 minibus	15 cars 1 bus, 1 m/c	1	1
3.45-4.00	7 cars, 2 buses	14 cars, 2 buses	2	3
4.00-4.15	17 cars	15 cars, 2 minibuses	3	2
4.15-4.30	8 cars, 1 bus	17 cars, 1 bus, 1 m/c	1	1
4.30-4.45	8 cars, 1 bus	18 cars, 1 bus	1	1
4.45-5.00	13 cars, 1 bus	12 cars, 1 bus	1	3
5.00-5.15	10 cars, 1 m/c, 1 p/c	18 cars, 1 m/c	2	1
5.15-5.30	13 cars, 1 bus	20 cars 1 bus, 1 m/c, 1 p/c		3
5.30-5.45	6 cars	12 cars, 1 bus, 1 m/c, 1 p/c	2	1
5.45-6.00	7 cars 2 buses	14 cars, 1 bus		3

Table 8.6: Southdown Road at Parsons Court afternoon survey – Friday 9 October 2009

Trip Rate validation

8.1.16 In the 3 hour morning survey a total of 98 motor vehicles travelled from Insworke/Southdown and 166 towards Insworke/Southdown. Beyond the Insworke residential area the employment facilities in the Marina areas will attract trips in the morning but are unlikely to generate many departure trips during this time. Hence it is reasonable to assume that most of the village bound trips were associated with the dwellings to the east of Parsons Court.

8.1.17 Departure trip rates for Insworke/Southdown (excluding buses) are shown in Table 8.7 and compared with the departure trip rates for Parsons Court.

Hour	Southdown departure trip rate - vehicles	Parsons Court departure trip rate - vehicles	Southdown departure trip rate - pedestrians	Parsons Court departure trip rate - pedestrians
7.00-8.00	0.16	0.10	0.02	0.1
8.00-9.00	0.25	0.35	0.09	0.6
9.00-10.00	0.21	0.20	0.02	0

Table 8.7: Morning survey period Departure Trip Rate comparison

8.1.18 Reversing the logic applied in the morning it could be reasonable to assume that the vehicles leaving Insworke/Southdown will include a number from the Marinas and that the vehicles travelling towards Insworke/Southdown will be primarily associated with the Insworke dwellings. Hence it is reasonable to assume that most of the Insworke/Southdown bound trips were associated with the dwellings to the east of Parsons Court.

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8.1.19 Arrival trip rates (excluding buses) are shown in Table 8.8 and compared with the arrival trip rates for Parsons Court.

Hour	Southdown arrival trip rate - vehicles	Parsons Court arrival trip rate - vehicles	Southdown arrival trip rate - pedestrians	Parsons Court arrival trip rate - pedestrians
3.00-4.00	0.25	0.4	0.02	0.1
4.00-5.00	0.25	0.4	0.03	0.05
5.00-6.00	0.27	0.3	0.03	0.15

Table 8.8: Afternoon survey period Arrival Trip Rate comparison

8.1.20 Inspection of the above tables shows that the peak direction trip rates measured for Parsons Court are consistently higher than for the Insworke/Southdown area in the peak hours. It is therefore concluded that they are not under-reporting the likely situation and can be reliably used in predicting the likely traffic flows resulting from the proposed development.

Hounster Drive Survey

8.1.21 An additional validation was undertaken in comparing the trip generation surveyed for the Hounster Drive Estate. This contains 35 detached and semi-detached, generally owner occupied dwellings constructed around the 1980's. The comparison is shown in **Table 8.9**.

Time	Parsons Court Total Trip Rate	Hounster Drive Total Trip rate
7.00-8.00	0.25	0.26
8.00-9.00	0.45	0.40
9.00-10.00	0.40	0.66
3.00-4.00	0.55	0.54
4.00-5.00	0.80	0.46
5.00-6.00	0.65	0.66

Table 8.9: Trip rate comparison with Hounster Drive development

8.1.22 **Table 8.9** shows that the Parsons Court development has a higher peak trip rate than the Hounster Drive development which is likely to result from the circumstances of the occupants. It demonstrates the value of using locally generated tripe rate figures rather than relying on the TRICs database.

8.1.23 It is recommended that the Parsons Court trip rates should be used in the Transport Assessment.

8.1.24 On the basis that the proposed development is being provided for persons on the Millbrook housing waiting list it could be anticipated that the new residents would already be living in the village and hence will already be travelling and included in the traffic surveys carried out for this Study.

8.1.25 There is however the possibility that the accommodation vacated by the new residents would be filled by persons from outside the village and hence there could be additional traffic movements.

8.1.26 In order to provide a 'worst case analysis' the Transport Assessment will assume that the proposed development will provide 100% new trips. The reality will lie somewhere between the two extremes.

8.1.27 In addition the Transport Assessment will take into consideration the impact of the approved residential development off Insworke Close, using a similar trip rate as it will be a similar type of development.

Trip rate calculation

8.1.28 Using the Parsons Court trip rates the development of 22 dwellings is expected to produce the traffic flows shown in **Table 8.10**.

Time period	Trip Rate	Number of vehicle trips
7.00-8.00	0.25	6
8.00-9.00	0.45	10
9.00-10.00	0.40	9
3.00-4.00	0.55	12
4.00-5.00	0.80	18
5.00-6.00	0.65	14

Table 8.10: Predicted traffic generation from proposed extension to Parsons Court – two-way trips

8.1.29 Inspection of the TRICs database for a similar development suggests that based on the flows in Table 8.10 the total two-way traffic flow generated by the development over the period 7am – 7pm would be 160 vehicles. This would be experienced at the site access, however as previously explained these would not all be additional trips throughout the whole network providing the dwellings were occupied by existing Millbrook residents and any accommodation that they vacated was filled by existing Millbrook residents.

Committed Development

8.1.30 Approval has recently been granted for 15 affordable dwellings to be accessed off Insworke Close. It is reasonable to assume that they would also display the same travel characteristics as Parsons Court and hence would generate a maximum number of vehicular trips as shown in **Table 8.11**.

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Time period	Trip Rate	Number of vehicle trips
7.00-8.00	0.25	4
8.00-9.00	0.45	7
9.00-10.00	0.40	6
3.00-4.00	0.55	8
4.00-5.00	0.80	12
5.00-6.00	0.65	10

Table 8.11: Predicted traffic generation from proposed extension to Insworke Close – two-way trips

8.1.31 Using the same TRICs factor as above the total two-way flow generated by this committed development between 7am – 7pm would be 108 vehicles.

8.1.32 Given that at 22% of the morning peak hour trips and 50% of the afternoon peak hour trips were surveyed to be travelling in the non-peak direction it is reasonable to assume that at least 10% in the morning and 25% in the afternoon of the total number of predicted trips will not reach the external road network. Making this reduction to the predicted trips in Tables 8.10and 8.11 suggests that the two developments will provide the following external trips:

- Proposed development: AM peak hour 9; PM peak hour 14
- Insworke Close: AM peak hour 6; PM peak hour 9

8.1.33 These trips will be distributed on the various routes out of the village:

- St Johns Road
- St Andrews Street
- Fore Street / West Street / West Street / Hounster Hill
- Fore Street / Millpool Head / Dodbrook / West Street / Hounster Hill
- Fore Street / Millpool Head / Four Lanes End
- Greenland / Anderton

8.1.34 Unless the new residents of these two developments relocate from within the Insworke/Southdown area all of these trips (15 in the morning and 23 in the afternoon peak hour) will travel on Southdown Road at its junction with St John's Road. From this mini-roundabout the vehicles will start to take the diverse routes and their impact may diminish depending upon the route taken.

8.1.35 Beyond the mini-roundabout the number of additional trips on each route may also diminish if some of the new residents have relocated from other properties within the village and are already travelling through the village. As previously explained the potential impact depends on whether 'replacement' residents come from outside the village.

8.1.36 The above peak hour predicted trip numbers will be used in the assessment of the impact of the development on the various routes.

8.1.37 Although it cannot be justified from the data collected it could be reasonable to assume that a 10% reduction for internal trips could be made to the all day flows such that the following

maximum number of additional vehicles trips would appear distributed on the various external routes:

- 7am-7pm vehicle trips from the proposed development: 144
- 7am-7pm vehicle trips from the Insworke Close development: 97

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9 Traffic Survey Results / Capacity Assessment

9.1 Hounster Hill

9.1.1 The afternoon survey in Hounster Hill was undertaken on Wednesday 14 October and the morning survey on Thursday 15 October 2009. The purpose of the survey was to provide an indication of the operation of the Priority System at the bottom of the hill and identify the level of congestion on the hill.

9.1.2 During other surveys it was observed that there appeared to be a significant number of larger vans within the car and van classification and given the number of narrow roads within the village these vehicles may have a disproportionate impact. A check on the numbers was undertaken within the Hounster Hill survey and the results are contained within **Table 9.7**.

9.1.3 The results of the morning survey are contained within **Table 9.1**.

	Into Village				Out of Village		
Time	No stop (1)	Give way vehicles	Give way events	Maximum Queue	No stop (1)	No stop with priority (2)	Stop on hill beyond narrowing (3)
7.00-7.15	8	3	3	1	29+1hgv+1m/c	3	1
7.15-7.30	9+2hgv+1lgv +2minibus	1	1	1	28	1	3
7.30-7.45	8	1	1	1	27+1hgv+1minibus+3m/c+1p/c	1	
7.45-8.00	12	4	4	1	31+3minibus+2m/c	4	
8.00-8.15	4+1hgv	6+1hgv+1lgv	6	3	21+1m/c	15	1
8.15-8.30	17+1hgv	1	1	1	42+2hgv+1m/c	1lgv	1
8.30-8.45	16	1	1	1	40	1	
8.45-9.00	23+1hgv	9+1hgv	5	5	32+1m/c	11	1R
9.00-9.15	9+2minibus	4	4	1	27+1hgv	3+1m/c	
9.15-9.30	19+1lgv	5+1hgv	4	2	31	5 +1bus	1
9.30-9.45	18+1lgv+2m/c	1	1	1	29	2	
9.45-10.00	19+1hgv+1m/c	2	2	1	32+1hgv	2	1

Table 9.1: Morning survey at Hounster Hill Thursday 15 0ctober 13 2009

Key: Numbers are cars and light vans unless otherwise indicated

9.1.4 A synopsis of the morning survey period is shown in **Table 9.2.**

Over the 3 hour period	In the peak hour
• 639 motor vehicles travelled on Hounster Hill • 15 were heavy goods vehicles – 2.3% • 69% travelled away from West Street and 31% towards West Street • 21% of vehicles travelling towards West Street had to give way at the build out • The maximum observed queue was 5 vehicles • 88% of vehicles travelling from West Street did so without a vehicle waiting at the build out • On 9 occasions vehicles travelling from West Street stopped on the hill to allow vehicles to travel downhill • 1 pedal cyclist was observed	• 251 motor vehicles travelled on Hounster Hill • 7 were heavy goods vehicles – 3.0% • 73% travelled away from West Street and 27% towards West Street • 32% of the vehicles travelling towards West Street had to give way at the build out • The maximum observed queue was 5 vehicles • 83% of vehicles travelling from West Street did so without a vehicle waiting at the build out • On 3 occasions vehicles travelling from West Street stopped on the hill to allow vehicles to travel downhill • 0 pedal cyclists were observed

Table 9.2: Hounster Hill morning survey 15 October 2009 synopsis

9.1.5 The results of the afternoon survey are contained within **Table 9.3.**

	Into Village				Out of Village		
Time	No stop (1)	Give way vehicles	Give way events	Maximum Queue	No stop (1)	No stop with priority (2)	Stop (3)
3.00-3.15	14+2p/c	11	10	2	20+1hgv+1lgv +1minibus	15	
3.15-3.30	18	10+1m/c	7	3	27	13	
3.30-3.45	24+1m/c	5	3	2	24	3	
3.45-4.00	27	10	5	5	13	11+1hgv	
4.00-4.15	24+1lgv+1m/c +3minibus	9	2	5	26	2	
4.15-4.30	17+1hgv+1m/c	4	2	2	21+1hgv +2minibus	4	
4.30-4.45	30+1minibus	13	6	3	10	12	
4.45-5.00	42+1m/c	11	7	3	18	14	
5.00-5.15	36	7	4	3	18	8	
5.15-5.30	29+2m/c	6	3	4	14	5	
5.30-5.45	35+1m/c	7	4	3	13	3+1minibus	
5.45-6.00	36+1hgv+1m/c+ 1minibus	4	3	2	18+1minibus	4	

Table 9.3: Afternoon survey at Hounster Hill Wednesday 14 0ctober 13 2009

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Key: Numbers are cars and light vans unless otherwise indicated. (1) No stop – a vehicle passed the build out with no vehicle approaching in the opposite direction; (2) No stop with priority – a vehicle from the village passed the build out while an opposing vehicle gave way to it; (3) Stop - the vehicle from the village gave way to a vehicle entering the village against the priority sign

9.1.6 A synopsis of the afternoon survey is contained in **Table 9.4.**

Over the 3 hour period	In the peak hour
• 763 motor vehicles travelled on Hounster Hill	• 269 motor vehicles travelled on Hounster Hill
• 5 were heavy goods vehicles – 0.7%	• 2 were heavy goods vehicles – 0.7%
• 43% travelled away from West Street and 57% towards West Street	• 41% travelled away from West Street and 59% towards West Street
• 22% of vehicles travelling towards West Street had to give way at the build out	• 23% of the vehicles travelling towards West Street had to give way at the build out
• The maximum observed queue was 5 vehicles	• The maximum observed queue was 5 vehicles
• 68% of vehicles travelling from West Street did so without a vehicle waiting at the build out	• 71% of vehicles travelling from West Street did so without a vehicle waiting at the build out
• On 0 occasions vehicles travelling from West Street stopped on the hill to allow vehicles to travel downhill	• On 0 occasions vehicles travelling from West Street stopped on the hill to allow vehicles to travel downhill
• 2 pedal cyclists were observed	• 0 pedal cyclists were observed

Table 9.4: Hounster Hill afternoon survey 14 October 2009 synopsis

Observations

9.1.7 It was observed that delays at the build out lasted no more than a few seconds.

9.1.8 It was observed that local residents parked for longer than necessary to load and unload on the waiting restrictions in the section between the Radford Lane junction and the build out. This was a cause of congestion and possibly the action referred to in the consultation response from First D&C.

Capacity assessment

9.1.9 It is not possible to make an assessment of the absolute capacity of this section of road by conventional modelling techniques and because of the restricted road widths it will vary depending on the volume of hgv traffic at any one time. It has been observed that congestion has been related to the conflict between buses/coaches and delivery vehicles. First D&C has withdrawn the early morning service that used to travel on Hounster Hill and the school buses to Torpoint have also been re-rerouted away on to the Whitsand Bay route.

9.1.10 An assessment of available capacity has been made on the basis that within the peak hour there is a peak flow in one of the 15 minute survey periods. The highway has managed to cater for this peak flow and hence it is reasonable to assume that it could cater for this flow in the other three 15 minute periods. This provides an indication of the minimum spare capacity available.

9.1.11 The results are shown in **Tables 9.5** and **9.6**.

Time	Two-way traffic flow	Additional traffic flow
8.00-8.15	50	28
8.15-8.30	65	13
8.30-8.45	58	20
8.45-9.00	78	-
Total	251	61

Table 9.5: Available capacity morning peak hour

Time	Two-way traffic flow	Additional traffic flow
4.00-4.15	66	20
4.15-4.30	51	35
4.30-4.45	66	20
4.45-5.00	86	-
Total	269	75

Table 9.6: Available capacity afternoon peak hour

9.1.12 The results of classifying the 'Car' category into cars and large vans are shown in **Table 9.7.**

Time	Cars and small vans	Large vans	% of large vans
7.00-10.00	615	90	14.6%
3.00-6.00	761	71	9.3%

Table 9.7: Determination of the proportion of large vans

Conclusions

9.1.13 The above Tables 9.5 and 9.6 indicate that there should be adequate capacity to cater for the maximum number of peak hour trips (15 morning / 23 afternoon) predicted to be generated by the proposed and committed development and that there should not be a significant increase in delay at this point.

9.1.14 Table 9.7 indicates that within the 'Car' classification of the survey there were significant proportions of large vans. These vehicles will have a greater impact in the narrow sections of road and the road network in the local area appears to be able to cope with them.

9.2 West Street / Radford Lane

9.2.1 Surveys were undertaken at the junction of West Street with Radford Lane on Monday 12 October 2009. The weather was fine and dry. The purpose of the survey was to understand how the priority system in the narrow section of West Street coped with the existing flow of traffic and to understand how the drivers used it.

9.2.2 The results of the 3 hour morning survey are contained within **Table 9.8**.

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	From Hounster Hill						From West Street					From Radford Lane	
			To West Street					To Hounster Hill					
Time	Pedestrians	To Radford Lane	No stop (1)	Stop (2)	Reverse (3)	Maximum Queue	To Radford Lane	No stop (1)	Stop (4)	Reverse (3)	Maximum queue	To Hounster Hill	To Dodbrook
7 00-7 15	1		5+1 hgv					37+2m/c	2				2
7 15-7 30	2		11+2hgv	1			1	23	1			1	1
7 30-7 45	1		5+1hgv +1iminibus	3	3		3	28+4m/c+ 2hgv+1p/c +1minibus					
7 45-8 00	6		12	3	1	2	1+1minib us	25+1hgv+ 1minibus	4				1
8 00-8 15	2		8+1hgv	4			2	34+1minibu s	3+1hgv				4
8 15-8 30	3		7+2hgv+ 1lgv	3+3hgv	1		2	33+2hgv+ 1m/c	3		2		
8 30-8 45	9		18+1jcb	5+2tractors	1	3	1	28+2hgv+ 1lgv	4		2		4
8 45-9 00	6		13+1hgv+ 1lgv	1+4hgv			3	22+2hgv+1 m/c	6		4		2
9 00-9 15	4		13+1hgv	4		2	1	25	9		3		2
9 15-9 30	5	1	15+2hgv+ 1tractor	3		2	2	24+1bus	3		2		2
9 30-9 45	6		16	4				27+1p/c	1				1
9 45-10 00	4		17+1hgv+1l gv+1minibu s	1+1lgv+1m/c			1	32+1hgv	3			1	2

Table 9.8: Morning survey at West Street / Radford Lane Monday 0ctober 12 2009

Key: (1) No stop – the vehicle passed through without giving way; (2) Stop – the vehicle stopped to allow priority to vehicles approaching in the other direction; (3) Reverse – the vehicle reversed to enable an approaching vehicle to pass; (4) Stop - the vehicle stopped to allow priority to vehicles approaching in the other direction once it had passed the Radford Lane junction. The vehicle numbers on their own refer to cars and light vans.

9.2.3 Further analysis of the survey data is contained within **Table 9.9**.

Time	Total with no conflict from Hounster Hill	Total with no conflict towards Hounster Hill	Total in conflict from Hounster Hill	% in conflict from Hounster Hill	Total in conflict towards Hounster Hill	% in conflict towards Hounster Hill	Total flow overall from Hounster Hill into narrows	Total flow overall towards Hounster Hill from narrows	Through the narrows from and to Radford Lane
7.00-7.15	6	39	-	-	2	5%	6	41	2
7.15-7.30	13	23	1	7%	1	4%	14	24	2
7.30-7.45	7	25	3	42%	-	-	10	35	3
7.45-8.00	12	27	3	25%	4	13%	15	31	3
8.00-8.15	9	35	4	31%	4	10%	13	39	6
8.15-8.30	10	36	6	38%	3	8%	16	39	2
8.30-8.45	19	31	7	27%	4	11%	26	35	1
8.45-9.00	15	25	5	25%	6	19%	20	31	5
9.00-9.15	14	25	4	22%	9	26%	18	34	3
9.15-9.30	18	25	3	14%	3	11%	21	28	4
9.30-9.45	16	28	4	20%	1	3%	20	29	1
9.45-10.00	20	33	3	13%	3	8%	23	36	3

Table 9.9: West Street / Radford Lane morning survey 12 October 2009 analysis

9.2.4 A synopsis of the morning survey period is shown in **Table 9.10**.

Over the 3 hour period	In the peak hour
• 629 motor vehicles passed through the narrows	• 233 motor vehicles passed through the narrows
• 30 were heavy goods vehicles – 4.8%	• 18 were heavy goods vehicles – 7.7%
• 67% travelled away from West Street and 33% towards West Street	• 60% travelled away from West Street and 40% towards West Street
• 21% of vehicles travelling from Hounster Hill had to give way in the narrows	• 29% of the vehicles travelling form Hounster Hill had to give way in the narrows
• 10% of vehicles travelling towards Hounster Hill had to give way once past Radford Lane	• 12% of vehicles travelling towards Hounster Hill had to give way once past Radford Lane
• The maximum observed queue was 4 vehicles	• The maximum observed queue was 4 vehicles
• 49 pedestrians walked through the narrow section	• 20 pedestrians walked through the narrow section
• 2 pedal cyclists passed through the narrows	• 0 pedal cyclists passed through the narrows

Table 9.10: West Street / Radford Lane morning survey 12 October 2009 synopsis

9.2.5 The results of the 3 hour afternoon survey are shown in **Table 9.11.**

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		From Hounster Hill					From West Street					From Radford Lane	
			To West Street					To Hounster Hill					
Time	Pedestrians	To Radford Lane	No stop (1)	Stop (2)	Reverse (3)	Maximum Queue	To Radford Lane	No stop (1)	Stop (4)	Reverse (3)	Maximum queue	To Hounster Hill	To Dodbrook
3 00-3 15	5		21		2		2	17	6+1hgv				6
3 15-3 30	5	1m/c	12	1			1	23	3+1minibus	1	3	1	3
3 30-3 45	2	1	22+2m/c	4	3	3	4+1p/c	29+1m/c	2				8
3 45-4 00	7		27+2m/c	5	1	3	5	20+1hgv	6		2		3
4 00-4 15	7		29	4		2	2	26	2+1minibus				1+1p/c
4 15-4 30	9	3	40	6	1	2	3	23+1hgv+1 m/c	5		2		2
4 30-4 45	9		30+2m/c	7	1	2	2	35+3m/c	2				7
4 45-5 00	2		34+3m/c	4	1	2	3	27	6		3		4+1minib us
5 00-5 15	11		33	12	1	5	2	15	7		2		6
5 15-5 30	7	2	28+1lgv+1m /c	2+1m/ c		2	3	21+1m/c	4		2		3
5.30-5 45	6		28+2m/c+1p /c	10	1	2	4	15+1hgv					
5 45-6 00	4		34+2m/c+1b us+2m/c+1 minibus	6	1	3	4+1m/c	11+2m/c	1				2

Table 9.11: Afternoon survey at West Street / Radford Lane Monday 0ctober 12 2009

Key: (1) No stop – the vehicle passed through without giving way; (2) Stop – the vehicle stopped to allow priority to vehicles approaching in the other direction; (3) Reverse – the vehicle reversed to enable an approaching vehicle to pass; (4) Stop - the vehicle stopped to allow priority to vehicles approaching in the other direction once it had passed the Radford Lane junction. The vehicle numbers on their own refer to cars and light vans.

9.2.7 Further analysis of the survey data is contained within **Table 9.12.**

Time	Total with no conflict from Hounster Hill	Total with no conflict towards Hounster Hill	Total in conflict from Hounster Hill	% in conflict from Hounster Hill	Total in conflict towards Hounster Hill	% in conflict towards Hounster Hill	Total flow overall from Hounster Hill into narrows	Total flow overall towards Hounster Hill from narrows	Through the narrows from and to Radford Lane
3.00-3.15	21	17	-	-	7	29%	21	24	8
3.15-3.30	12	23	1	8%	4	15%	13	27	4
3.30-3.45	24	30	4	14%	2	6%	28	32	12
3.45-4.00	29	21	5	15%	6	22%	34	27	8
4.00-4.15	29	26	4	12%	3	10%	33	29	3
4.15-4.30	40	25	6	13%	5	17%	46	30	5
4.30-4.45	32	38	7	18%	2	5%	39	40	9
4.45-5.00	37	27	4	10%	6	18%	41	33	8
5.00-5.15	33	15	12	27%	7	32%	45	22	8
5.15-5.30	30	22	3	9%	4	15%	33	26	6
5.30-5.45	30	16	10	25%	-	-	40	16	4
5.45-6.00	40	13	6	13%	1	8%	46	14	7

Table 9.12: West Street / Radford Lane afternoon survey 12 October 2009 analysis

9.2.8 A synopsis of the afternoon survey is contained in **Table 9.13.**

Over the 3 hour period	In the peak hour
• 757 motor vehicles passed through the narrows	• 316 motor vehicles passed through Dodbrook
• 4 were heavy goods vehicles – 0.5%	• 1 was a heavy goods vehicle – 0.3%
• 39% travelled away from West Street and 61% towards West Street	• 45% travelled away from West Street and 55% towards West Street
• 15% of vehicles travelling from Hounster Hill had to give way in the narrows	• 13% of the vehicles travelling from Hounster Hill had to give way in the narrows
• 15% of vehicles travelling towards Hounster Hill had to give way once past Radford Lane	• 12% of vehicles travelling towards Hounster Hill had to give way once past Radford Lane
• The maximum observed queue was 5 vehicles	• The maximum observed queue was 3 vehicles
• 74 pedestrians walked through the narrow section	• 27 pedestrians walked through the narrow section
• 2 pedal cyclists passed through the narrows	• 0 pedal cyclists passed through the narrows

Table 9.13: West Street / Radford Lane afternoon survey 12 October 2009 synopsis

Observations

9.2.9 It was observed that delays at the give way point were not excessive and mainly drivers slowed so that stopping was not necessary

9.2.10 The free flow journey time through the narrows was approximately 7 seconds.

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9.2.11 The pedestrian flow was inflated by the passage of construction workers in the area.

9.2.12 It was observed that local residents parked for longer than necessary to load and unload on the waiting restrictions at the mouth of the Radford Lane junction. This can have the impact of reducing the area available for vehicles heading towards Hounster Hill, after having negotiated the West Street narrow section to temporarily wait for their way to become clear. If this section fills up and vehicles continue to approach from Hounster Hill and from Dodbrook gridlock can occur. This situation was not observed on this day.

Capacity assessment

9.2.13 As in the case of Hounster Hill it is not possible to make an assessment of the absolute capacity of this section of road by conventional modelling techniques and because of the restricted road widths it will vary depending on the volume of heavy goods vehicle traffic at any one time.

9.2.14 An assessment of available capacity has been made on the basis that within the peak hour there is a peak flow in one of the 15 minute survey periods. The highway has managed to cater for this peak flow and hence it is reasonable to assume that it could cater for this flow in the other three 15 minute periods. This provides an indication of the minimum spare capacity available.

9.2.15 The results are shown in **Tables 9.14** and **9.15**.

Time	Two-way traffic flow	Additional traffic flow
8.00-8.15	58	4
8.15-8.30	57	5
8.30-8.45	62	-
8.45-9.00	56	6
Total	233	15

Table 9.14: Available capacity morning peak hour

Time	Two-way traffic flow	Additional traffic flow
4.00-4.15	65	23
4.15-4.30	81	7
4.30-4.45	88	-
4.45-5.00	82	6
Total	316	36

Table 9.15: Available capacity afternoon peak hour

Conclusions

9.2.16 The above tables indicate that there should be adequate capacity to cater for the maximum number of peak hour trips (15 morning / 23 afternoon) predicted to be generated by the proposed and committed development in the afternoon peak hour. This is likely to be also the case for the morning peak hour as it can be seen that the underlying flows are significantly lower during this time and if the capacity is raised to the afternoon level of 88 vehicles per 15

minutes then 117 additional vehicles could pass. It is also reasonable to assume that not all of the predicted trips will use West Street in any case.

9.2.17 It is not anticipated that the development would increase the short delays significantly.

9.3 West Street / Dodbrook

9.3.1 Surveys were undertaken at the junction of West Street with Dodbrook on Tuesday 13 October 2009. The weather was fine and dry. The purpose of the survey was to understand the operation of the priority system through the narrow section of West Street and determine the degree of reversing in Dodbrook due to the lack of visibility when entering West Street.

9.3.2 The results of the morning survey are shown in **Table 9.16**.

	From Dodbrook						From West Street (E)						From West Street (W)
Time	Pedestrians	No stop (1)	Give way to West Street (E) (2)	Give way to West Street (W) (2)	Reverse (3)	Maximum Queue	To Dodbrook	No stop (1)	Give way to Dodbrook (2)	Give way to West Street (W) (2)	Reverse (3)	Maximum queue	From West Street (W)
7.00-7.15	3	7+1m/c	2			1		31	1			1	10+2hgv
7.15-7.30	1	13	3		1	1	1	8+1hgv	2			2	8
7.30-7.45	2	21+1m/c		1		1	3	6+1m/c	2+1m/c +1p/c	1		1	5+2minibus
7.45-8.00	9	11+2minibus	2	4	2	5	6	12	6	3		1	28
8.00-8.15	10	18+1minibus		5	2	3	3	18+1hgv	3	5		2	13+1hgv
8.15-8.30	7	10+2m/c		2	2	2	7	12+1m/c	1	3		1	18+1hgv
8.30-8.45	6	12		3	3	1	2	18+1hgv+ 1m/c	2	10		3	31+1lgv
8.45-9.00		15		3		2	7	17	1	6		1	35+2hgv+1m/c
9.00-9.15	7	10+1hgv+ 1lgv	1	3		2	6	16+1m/c	3	4		2	22+1hgv+1minibus
9.15-9.30	7	10+1bus		2	2	2	9	15+1minibus	2	2+1hgv		1	21+2hgv+2minibus+1tractor
9.30-9.45	3	5+1hgv	1	2	3	1	6	6		1		1	31+1hgv
9.45-10.00	4	8	1	1		1	8	6		9		2	34+1coach

Table 9.16: Morning survey at West Street / Dodbrook Tuesday 0ctober 13 2009

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Key: (1) No stop – the vehicle passed through without giving way; (2) Give way – the vehicle stopped to allow priority to vehicles approaching in the other direction specified; (3) Reverse – the vehicle reversed to enable an approaching vehicle to pass. The vehicle numbers on their own refer to cars and light vans.

9.3.3 A synopsis of the morning survey period is shown in **Table 9.17**.

Over the 3 hour period	In the peak hour
• 711 motor vehicles passed through the narrow section	• 273 motor vehicles passed through the narrow section
• 16 were heavy goods vehicles – 2.2%	• 6 were heavy goods vehicles – 2.2%
• 61% travelled through the narrows towards Radford and 39% towards Dodbrook	• 62% travelled through the narrows towards Radford and 38% towards West Street
• 26% of vehicles from Dodbrook had to give way in the narrows	• 29% of the vehicles from Dodbrook had to give way in the narrows
• The maximum observed queue on Dodbrook was 5 vehicles	• The maximum observed queue on Dodbrook was 3 vehicles
• 15 vehicles from Dodbrook reversed	• 7 vehicles from Dodbrook reversed
• 29% of vehicles proceeding from West Street (e) to the narrows gave way	• 31% of vehicles proceeding from West Street (e) to the narrows gave way
• The maximum observed queue on West Street (e) was 3 vehicles	• The maximum observed queue on West Street (e) was 3 vehicles
• 19% of vehicles on West Street (e) turned towards Dodbrook	• 16% of vehicles on West Street (e) turned towards Dodbrook
• 1 pedal cyclist was observed	• 0 pedal cyclists were observed
• 61 pedestrians walked through the narrow section	• 23 pedestrians walked through the narrow section

Table 9.17: West Street / Dodbrook morning survey 13 October 2009 synopsis

9.3.4 The results of the afternoon survey are contained within **Table 9.18**.

		From Dodbrook					From West Street (E)						From West Street (E)
Time	Pedestrians	No stop (1)	Give way to West Street (E) (2)	Give way to West Street (W) (2)	Reverse (3)	Maximum Queue	To Dodbrook	No stop (1)	Give way to Dodbrook (2)	Give way to West Street (W)(2)	Reverse (3)	Maximum queue	From West Street (W)
3 00-3 15	7	18		3	2	1	9	6+1hgv	2	4		1	30
3 15-3 30	3	9+1coach		4	1	1	6	8+1minibus	2	1	2		28
3 30-3 45	5	11		4		2	6+1m/c	8	3	2			28+1m/c
3 45-4.00	1	9		3	5	1	6	13	2	6+1minibus		3	37
4 00-4 15	5	19	1	2	1	1	11+3 m/c	7	3	6			40+1lgv+1 m/c+1minibus
4.15-4 30	5	15		1+1lgv	3	1	5	9	2	8	2	3	37+1m/c
4 30-4 45	8	7+1minibus	1	8	1	4	6	11	2	7	1	3	43+1minibus
4 45-5 00	16	7		3		1	7	9	1	3			35+1m/c+1p/c
5 00 5 15	3	10+1hgv		2	3	1	3	5	5	1+1m/c			39+1lgv+1 m/c
5 15-5 30	8	6	1		1	1	11	7	1+1m/c	2			46+1minibus
5 30 5 45	12	7+1m/c		1	2	1	8	15	2	7			35+2m/c+1p/c
5 45-6 00	8	10+1m/c		3	1	1	7	12+1m/c	1	4		4	31+1hgv+2 m/c+1p/c

Table 9.18: Afternoon survey at West Street / Dodbrook Tuesday 0ctober 13 2009

Key: (1) No stop – the vehicle passed through without giving way; (2) Give way – the vehicle stopped to allow priority to vehicles approaching in the other direction specified; (3) Reverse – the vehicle reversed to enable an approaching vehicle to pass. The vehicle numbers on their own refer to cars and light vans.

9.3.5 A synopsis of the afternoon survey is contained in **Table 9.19.**

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Over the 3 hour period	In the peak hour
• 835 motor vehicles passed through the narrow section • 3 were heavy goods vehicles – 0.4% • 47% travelled through the narrow section towards Radford and 53% towards Dodbrook • 31% of vehicles from Dodbrook had to give way in the narrows • 10 vehicles from Dodbrook gave way to vehicles from West Street (e) • The maximum observed queue was 4 vehicles • 20 vehicles from Dodbrook reversed • 43% of vehicles from West Street (e) to the narrows gave way • The maximum observed queue on West Street (e) was 3 vehicles • 30% of vehicles on West Street (e) turned left towards Dodbrook • 3 pedal cyclists were observed • 81 pedestrians walked through the narrow section	• 301 motor vehicles passed through the narrow section • 0 were heavy goods vehicles – 0% • 47% travelled through the narrow section towards Radford and 53% towards Dodbrook • 31% of the vehicles from Dodbrook had to give way in the narrows • 0 vehicles from Dodbrook gave way to vehicles from West Street (e) • The maximum observed queue was 4 vehicles • 5 vehicles from Dodbrook reversed • 49% of vehicles from West Street(e) towards the narrows gave way • The maximum observed queue in West Street (e) was 3 vehicles • 31% of vehicles on West Street (e) turned left towards Dodbrook • 1 pedal cyclist was observed • 34 pedestrians walked through the narrow section

Table 9.19: West Street / Dodbrook afternoon survey 13 October 2009 synopsis

Observations

9.3.6 The number of vehicles queuing at any one time was low and delay times were not significant.

9.3.7 It was observed that a significant number of drivers from Dodbrook followed the driver in front into the West Street narrows without checking whether they had priority or not, possibly assuming that if the way was clear for the one in front it was clear for them. The impact of this can be that the reservoir on the far side of the junction between the end of the narrows and Radford Lane can fill up, the narrow section fills with vehicles from Dodbrook, which then prevent the vehicles from Hounster Hill proceeding and if they cannot move then the reservoir cannot empty. This critical situation was not observed during the survey.

Capacity assessment

9.3.8 As before it is not possible to make an assessment of the absolute capacity of this section of road by conventional modelling techniques and because of the restricted road widths it will vary depending on the volume of hgv traffic at any one time.

9.3.9 An assessment of available capacity has been made on the basis that within the peak hour there is a peak flow in one of the 15 minute survey periods. The highway has managed to cater for this peak flow and hence it is reasonable to assume that it could cater for this flow in the other three 15 minute periods. This provides an indication of the minimum spare capacity available.

9.3.10 The results are shown in **Tables 9.20** and **9.21**.

Time	Two-way traffic flow	Additional traffic flow
8.00-8.15	67	15
8.15-8.30	57	31
8.30-8.45	**82**	-
8.45-9.00	80	2
Total	286	48

Table 9.20: Available capacity morning peak hour

Time	Two-way traffic flow	Additional traffic flow
4.00-4.15	**82**	-
4.15-4.30	74	8
4.30-4.45	74	**8**
4.45-5.00	59	23
Total	289	39

Table 9.21: Available capacity afternoon peak hour

Conclusions

9.3.11 The above tables indicate that there should be adequate capacity to cater for the maximum number of peak hour trips (15 morning / 23 afternoon) predicted to be generated by the proposed and committed development.

9.3.12 Queuing and delay are not anticipated to increase significantly as a result of the proposed development.

9.4 Dodbrook

9.4.1 A survey of movement through the narrow section of Dodbrook was undertaken on Thursday 8th September 2009. The weather was fine and dry all day and there were no incidents in the immediate area that would affect traffic movement in the area.

9.4.2 The survey was undertaken to observe whether vehicles passed through the narrow section without stopping or whether they gave way to vehicles proceeding in the opposite direction. The survey also counted pedestrian movement through this section of road.

9.4.3 The results of the morning survey are contained in **Table 9.22**.

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Time	From West Street - No conflict	From Millpool Head - No conflict	Priority
7.00-7.15	8 cars	22 cars, 1 LGV	1/3
7.15-7.30	12 cars, 1 hgv, 1 minibus	29 cars	1/1ambulance
7.30-7.45	11 cars, 1 hgv	21 cars, 1 minibus, 1 m/c	1/1, 1/2
7.45-8.00	18 cars	9 cars, 2 minibus	1/hgv, 1/minibus, 1/1, 1/1, 1/1
8.00-8.15	15 cars	19 cars, 1 m/c	2/1, 1/1, 2/2, 2/1, 1/1, 1/1, 1/1
8.15-8.30	17 cars, 1 hgv, 1 p/c	11 cars, 1 m/c	
8.30-8.45	15 cars, 1 hgv, 1 p/c	6 cars, 2 m/c	1/1, 3/1, 1/1, 2/1
8.45-9.00	30 cars	11 cars, 1 hgv	1/1, 1/1, 1/1, 1/1, 1/1
9.00-9.15	21 cars, 1 hgv, 1 minibus	10 cars	3/1 minibus, 1/1
9.15-9.30	24 cars, 1 lgv	4 cars, 1 hgv, 1 bus	1/1, 1/1+hgv
9.30-9.45	19 cars, 1 hgv	11 cars, 1 lgv, 1 m/c	4/1
9.45-10.00	34 cars, 2 hgv, 1 m/c, 1 tractor	12 cars	2/1, 1/1

Table 9.22: Dodbrook morning survey 8 October 2009 raw data

Key:

- Cars – includes light vans: hgv – heavy goods vehicle; lgv - light goods vehicle; m/c – motorcycle; p/c - pedal cycle
- **2**/1 – 1 vehicle approaching from Millpool Head gave way to 2 vehicles approaching from West Street
- **1**/*1*, 1/***1*** – the numbers in italics represent a vehicle that initially gave way in one direction and then took priority over another in the opposite direction. In the subsequent table this is counted as two give way events involving one vehicle in the total.

9.4.4 Further analysis of the survey data is contained within **Table 9.23**.

Time	Total with No conflict from West Street	Total with no conflict from Millpool Head	Total in conflict from West Street	Total in conflict from Millpool Head	Total flow overall from West Street	Total flow overall from Millpool Head	% in conflict
7.00-7.15	8	23	1	4	9	27	14%
7.15-7.30	15	29	1	1	16	30	4%
7.30-7.45	12	23	2	3	14	26	13%
7.45-8.00	18	11	5	5	23	16	26%
8.00-8.15	15	20	10	8	25	28	34%
8.15-8.30	19	12	0	0	19	12	-
8.30-8.45	17	8	7	4	24	12	31%
8.45-9.00	30	12	5	5(3)	35	15	16%
9.00-9.15	23	10	4	2	27	12	15%
9.15-9.30	25	6	2	3	27	9	14%
9.30-9.45	20	13	4	1	24	14	13%
9.45-10.00	38	12	3	2	41	14	9%

Table 9.23: Dodbrook morning survey 8 October 2009 analysis

Key: 5(3) indicates that there were 5 conflict events involving 3 individual vehicles

9.4.5 A synopsis of the morning survey period is shown in **Table 9.24**.

Over the 3 hour period	In the peak hour
• 499 vehicles passed through Dodbrook	• 156 vehicles passed through Dodbrook
• 9 were heavy goods vehicles – 1.8%	• 3 were heavy goods vehicles – 1.9%
• 57% travelled away from West Street and 43% towards West Street	• 69% travelled away from West Street and 31% towards West Street
• 16% of vehicles had to give way in the narrows	• 11% of the vehicles had to give way in the narrows
• The maximum observed queue was 4 vehicles	• The maximum observed queue was 3 vehicles
• 2 pedal cyclists were observed	• 2 pedal cyclists were observed
• 6 pedestrians walked through the narrow section, 4 when vehicles were passing	• 3 pedestrians walked through the narrow section, 2 when vehicles were passing

Table 9.24: Dodbrook morning survey 8 October 2009 synopsis

9.4.6 The afternoon survey data is contained in **Table 9.25**.

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Time	From West Street No conflict	From Millpool Head No conflict	Priority
3.00-3.15	42 cars, 1 p/c	11 cars, 1 minibus	**1**/1hgv, **1**/1, **2**/1, 1/**1**
3.15-3.30	17 cars	13 cars	1/**1**, 3/**2**, 1/**3**, **2**/1, 1/**1**
3.30-3.45	36 cars, 1hgv	15 cars	*2*/**3**, **2**/1, 1/**1**, 1/**1**, 1/**1**, 2/**1**, 1/1, 1/1, 2/**1**
3.45-4.00	46 cars, 1 minibus, 1 m/c	12, 1hgv	1/3
4.00-4.15	39 cars	16 cars, 1 minibus	1/**1**, 1/1, 1/2
4.15-4.30	53 cars, 3 m/c	9 cars	1/1, 1/1, 1/1, 1/1, 3/1, 3/1, 1/1, 3/1
4.30-4.45	31 cars, 1 p/c	17 cars	**4**/1, 1/**1**, 1/**2**, **5**/1, 1/2, 2/**2**
4.45-5.00	28 cars, 2 m/c	17 cars	1/*1*, 2/**1**+*1*, 1/1, 1/1
5.00-5.15	29 cars	11 cars	2/**2**, **1**/1, **3**/1, *1*/**1**, *1*/1, **4**/1, 2/**1**
5.15-5.30	32 cars, 1 p/c	7 cars, 2 p/c	2/**1**, **4**/1, 5/**1**, *1*/1, *1*/1, 1/**1**, 3/1, 1/1
5.30-5.45	33 cars, 3 m/c	15 cars, 2 m/c	**2**/1, 1/1, **1**/1, 1/1, 2/*1*, 3/1, 2/**2**, 1/1, 2/1
5.45-6.00	36 cars, 1 minibus, 2 m/c	7 cars	1/1, 2/1, 1/1, 2/2, 2/1

Table 9.25: Dodbrook afternoon survey 8 October 2009 raw data

Key:

- Cars – includes light vans: hgv – heavy goods vehicle; lgv - light goods vehicle; m/c – motorcycle; p/c - pedal cycle
- **2**/1 – 1 vehicle approaching from Millpool Head gave way to 2 vehicles approaching from West Street
- **1**/*1*, 1/***1*** – the numbers in italics represent a vehicle that initially gave way in one direction and then took priority over another in the opposite direction. In the subsequent table this is counted as two give way events involving one vehicle in the total.

9.4.7 Further analysis of the afternoon survey is contained within **Table 9.26**.

Time	Total with No conflict from West Street	Total with no conflict from Millpool Head	Total in conflict from West Street	Total in conflict from Millpool Head	Total flow overall from West Street	Total flow overall from Millpool Head	% in conflict
3.00-3.15	43	12	5	4	48	16	14%
3.15-3.30	17	13	8	8	25	21	35%
3.30-3.45	37	15	13(11)	11	48	26	30%
3.45-4.00	48	13	1	3	49	16	6%
4.00-4.15	39	17	3	4	42	21	11%
4.15-4.30	56	9	14(11)	8	67	17	23%
4.30-4.45	32	17	14	9(7)	46	24	30%
4.45-5.00	31	17	5	5(4)	36	21	16%
5.00-5.15	29	11	14(13)	8	42	19	34%
5.15-5.30	33	9	18(13)	8	46	17	33%
5.30-5.45	36	17	15	10(9)	51	26	31%
5.45-6.00	39	7	8	6	47	13	23%

Table 9.26: Dodbrook afternoon survey 8 October 2009 analysis

9.4.8 A synopsis of the afternoon survey is shown in **Table 9.27**.

Over the 3 hour period	In the peak hour
• 770 vehicles passed through Dodbrook	• 271 vehicles passed through Dodbrook
• 3 were Heavy Goods vehicles – 0.4%	• 0 were heavy goods vehicles – 0%
• 71% travelled away from West Street and 29% towards West Street	• 70% travelled away from West Street and 30% towards West Street
• 12% of vehicles had to give way in the narrows	• 10% of the vehicles had to give way in the narrows
• The maximum observed queue was 5 vehicles	• The maximum observed queue was 3 vehicles
• 5 pedal cyclists were observed	• 1 pedal cyclist was observed
• 14 pedestrians walked through the narrow section, 10 when vehicles were passing	• 7 pedestrians walked through the narrow section, 5 when vehicles were passing

Table 9.27: Dodbrook afternoon survey 8 October 2009 synopsis

Observations

9.4.9 The maximum queues observed were short and hence delay times correspondingly short.

Capacity assessment

9.4.10 It is not possible to make an assessment of the absolute capacity of this section of road by conventional modelling techniques and because of the restricted road widths it will vary depending on the volume of heavy goods vehicle traffic at any one time. It has been observed

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that congestion has been related to the conflict between buses/coaches and delivery vehicles. First D&C has withdrawn the early morning service that used to travel on Hounster Hill and the school buses to Torpoint have also been re-rerouted away on to the Whitsand Bay route.

9.4.11 An assessment of available capacity has been made on the basis that within the peak hour there is a peak flow in one of the 15 minute survey periods. The highway has managed to cater for this peak flow and hence it is reasonable to assume that it could cater for this flow in the other three 15 minute periods. This provides an indication of the minimum spare capacity available.

9.4.12 The results are shown in **Tables 9.28 and 9.29.**

Time	Two-way traffic flow	Additional traffic flow
8.00-8.15	53	-
8.15-8.30	31	22
8.30-8.45	36	17
8.45-9.00	50	3
Total	170	42

Table 9.28: Available capacity morning peak hour

Time	Two-way traffic flow	Additional traffic flow
4.00-4.15	63	19
4.15-4.30	84	-
4.30-4.45	70	14
4.45-5.00	57	27
Total	274	60

Table 9.29: Available capacity afternoon peak hour

Pedestrians

9.4.13 As reported above 6 pedestrians were observed during the 3 hour morning survey, of which 2 were in the narrow section while vehicles were present, and 14 pedestrians were observed during the 3 hour afternoon survey, of which 10 were in the narrow section while vehicles were present.

9.4.14 As this section of road is not wide enough for two cars to pass the pedestrians, while not being in a particularly pleasant situation nevertheless had a reasonable amount of room. It takes approximately 25 seconds to walk though this section.

9.4.15 Beyond this there is a layby in front of two houses that provides the opportunity to walk off the carriageway.

9.4.16 Further on again is a second narrowed carriageway that is wide enough for two cars to pass, but not a car and a large vehicle and it is in this area that pedestrians are perhaps more vulnerable. It takes approximately 35 seconds to walk through this section before the footway at the junction with Millpool Head is reached.

Conclusions

9.4.17 The above tables indicate that there should be adequate capacity to cater for the maximum number of peak hour trips (15 morning / 23 afternoon) predicted to be generated by the proposed and committed development.

9.4.18 It is not anticipated that the proposed development will increase queues or delays particularly since the survey at the junction of King Street with Millpool Head confirms that a significant proportion (at least 60%) of traffic from The Parade travels via West Street as this provides a shorter route. Hence not all of the 23 trips would travel via Dodbrook.

9.4.19 The results show that while the chance of conflict bears some relationship to traffic volume it also appears to be a matter of luck whether vehicles arrive at the same time or not. This is demonstrated in the following extracts from **Table 9.30**.

Time	Total flow overall from West Street	Total flow overall from Millpool Head	% in conflict
3.15-3.30	25	21	35%
4.00-4.15	42	21	11%
4.45-5.00	36	21	16%

Table 9.30: Variation in degree of conflict

9.4.20 It is suggested that this variation is due to the fact that the opposing flows are not close to saturation.

9.5 St Andrew's Street

9.5.1 Surveys were undertaken at the junction of St Andrew's Street with Hounster Drive in the afternoon of Monday 12 October and the morning of Tuesday 13 October 2009. The weather was fine and dry.

9.5.2 The flows on St Andrew's Street were surveyed to gauge the current use of the street. The flows into and out of Hounster Drive were surveyed to gain a further insight into Trip Generation **(see Chapter 8)**.

9.5.3 The results of the morning survey are contained within **Table 9.31**.

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Time	From Hounster Drive to B3247	From Hounster Drive to St Andrew's Street	Into Hounster Drive from B3247	Into Hounster Drive from St Andrew's Street	St Andrew's Street from the village	St Andrew's Street towards the village	Pedestrians in St Andrew's Street from the village	Pedestrians in St Andrew's Street towards the village
7.00-7.15			1		1			
7.15-7.30	2	1			3			
7.30-7.45	1		m/c		5, 1m/c	1		
7.45-8.00	2		1		4	2		
8.00-8.15	1	1	1		4	2		
8.15-8.30	m/c	1			4	5		1
8.30-8.45	3		1			3		
8.45-9.00	4		1		1	2		
9.00-9.15	5	1	6			1		1
9.15-9.30	1		1		2	1		
9.30-9.45	1		2		1	4		
9.45-10.00	5		1	p/c	2	3		

Table 9.31: Morning survey at St Andrew's Street / Hounster Drive Tuesday 13 October 2009

Key: Numbers are cars and light vans unless otherwise specified

9.5.4 A synopsis of the morning survey period is shown in **Table 9.32**.

Over the 3 hour period	In the peak hour
• 46 motor vehicles travelled in Hounster Drive	• 14 motor vehicles travelled in Hounster Drive
• 65% travelled out, 35% in	• 79% travelled out, 21% in
• 56 motor vehicles travelled on St Andrew's Street	• 23 motor vehicles travelled on St Andrew's Street
• 50% travelled away from the village, 50% in	• 39% travelled away from the village, 61% in
• 0 heavy goods vehicles were observed	• 0 heavy gods vehicles were observed
• 1 pedal cyclist was observed	• 0 pedal cyclists were observed
• 2 pedestrians were observed in St Andrew's Street	• 1 pedestrian was observed in St Andrew's Street

Table 9.32: St Andrew's Street morning survey 13 October 2009 synopsis

9.5.5 The results of the afternoon survey are contained within **Table 9.33**.

Time	From Hounster Drive to B3247	From Hounster Drive to St Andrew's Street	Into Hounster Drive from B3247	Into Hounster Drive from St Andrew's Street	St Andrew's Street from the village	St Andrew's Street towards the village	Pedestrians in St Andrew's Street from the village	Pedestrians in St Andrew's Street towards the village
3.00-3.15	2				1	3	1	
3.15-3.30		1	2		1	2		
3.30-3.45	1		6		2	1		1
3.45-4.00	3		3, m/c		1	2		
4.00-4.15	1		2		3	4		
4.15-4.30	3		2		2	6		
4.30-4.45	1		3		1	8		
4.45-5.00	2	p/c	2		1	1		2
5.00-5.15	3	1, p/c	7	1	1	2, p/c		
5.15-5.30	2	2	2		2	3, m/c		
5.30-5.45	1		2		1	3		
5.45-6.00		1	2			3, m/c		

Table 9.33: Afternoon survey at St Andrew's Street / Hounster Drive Monday 12 October 2009

Key: Numbers are cars and light vans unless otherwise specified

9.5.6 A synopsis of the afternoon survey is contained in **Table 9.34.**

Over the 3 hour period	In the peak hour
• 61 motor vehicles travelled in Hounster Drive	• 16 motor vehicles travelled in Hounster Drive
• 43% travelled in, 57% out	• 44% travelled in, 56% out
• 61 motor vehicles travelled in St Andrew's Street	• 26 motor vehicles travelled in St Andrew's Street
• 29% travelled out of the village, 71% in	• 27% travelled out of the village, 73% in
• 0 heavy goods vehicles were observed	• 0 heavy goods vehicles were observed
• 3 pedal cyclists were observed	• 1 pedal cyclist was observed
• 4 pedestrians were observed in St Andrew's Street	• 2 pedestrians were observed in St Andrew's Street

Table 9.34: St Andrew's Street / Hounster Drive afternoon survey 12 October 2009 synopsis

Observations

9.5.7 The journey time along St Andrew's Street from the B3247 to Fore Street is approximately 90 seconds.

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Capacity Analysis

9.5.8 If it assumed that each vehicle using St Andrew's Street has 'exclusive use' of the street, i.e. it and only it is using the street at any one time, in the morning peak hour it would be occupied for 23 x 90 = 2070 seconds. This leaves 3600-2070 = 1530 seconds free for additional vehicles, which at 90 seconds per vehicle equates to 17 vehicles.

9.5.9 The trip generation prediction suggests that the proposed development would add a maximum of 15 vehicles to the road network (9 from the proposed development and 6 from the committed Insworke Close development).

9.5.10 In practice, more than one vehicle will be travelling on St Andrew's Street at and one time and while the journey time will be longer if a vehicle meets one coming in the opposite direction the time of overall occupation of the street per vehicle will be lower if one vehicle follows another in the same direction. It is likely therefore that the 'unoccupied' time will be greater than predicted and hence the theoretical capacity greater.

9.5.11 It is inconceivable that, if the combined population of Millbrook currently generates 23 vehicles onto St Andrew's Street in the morning peak hour, 37 properties in the two proposed developments will add a further 15 vehicles onto the street; they will be spread around the various routes.

9.5.12 A similar exercise undertaken for the evening peak hour reveals that the street currently carries 26 motor vehicles and has 'unoccupied' time available for 14 vehicles, which would be in excess of the potential share of the 23 predicted trips from the two proposed developments.

Conclusion

9.5.13 The conclusion is that there is sufficient theoretical capacity on St Andrew's Street for the share of the trips emanating from the proposed and committed developments that could be attracted to use the street.

9.5.14 From the above figures this share would appear to be very small.

9.5.15 Whether the environmental capacity of the road would be exceeded is something that is difficult, if not impossible to measure. The peak hour flows currently run at less than 1 vehicle every 2 minutes and are likely to remain at about this level. No doubt the residents would not welcome an increase in traffic however small.

9.6 Millpool Head / King Street

9.6.1 The afternoon survey of the junction of Millpool Head with King Street, West Street and Fore Street was undertaken on Wednesday 14 October and the morning survey on Thursday 15 October 2009. The weather during both surveys was fine and dry. The purpose of the survey was to understand the operation of a fairly complex junction.

9.6.2 The results of the morning survey are contained within **Table 9.35.**

	From Millpool Head				From King Street			From Fore Street		
Time	West Street Towards no stop (1)	West street Towards stop (2)	King Street Towards no stop (1)	King Street Towards stop (2)	Millpool Head Towards	West Street Towards	West Street reverse out (3)	To West Street	To Millpool Head	To King Street
7 00-7 15	3	1	2+1hgv+1bus		8+1hgv+2bus	12+1m/c+1p/c		1	2	
7 15-7 30	2+1hgv		2+1hgv+1bus	1	7+1p/c	5+1hgv		2		
7 30 7 45	4		8	1+1minibus	7+1minbus	5+3m/c+1p/c	3		1	
7 45-8 00	7	1	10+2bus		7+3minibus	18+1minibus	1	3+1m/c		
8 00-8 15	4		2+1bus	1hgv+1bus	7+3bus	21+1minibus+1m/c		5	2+1p/c	1+1p/c
8 15-8 30	4		11	3	7+1bus	19+1p/c		3	1	1+4p/c
8 30-8 45	9	2	10+1hgv+1bus	2	15+1p/c	24+1p/c	1	3	1	1+1p/c
8 45-9 00	8		21+1hgv	1	16	18+1m/c		5		1p/c
9 00-9 15	9	1	13+1bus+1minibus	3	12+1hgv+1bus	22+1m/c		2	2	
9 15-9 30	1	1	13+1bus+1p/c	4+1bus	17+2bus	21		1		1
9 30 9 45	2+1m/c		17	7	13	23+1hgv			1	1
9 45-10 00	4	2	14+1hgv	4	6+2minibus	18		3		

Table 9.35: Morning survey at Millpool Head / King Street 15 October 2009

Key: (1) vehicles approaching the junction proceeded without stopping; (2) vehicles approaching the junction stopped; (3) vehicles reversed out of West Street due to obstruction further in. The vehicle numbers on their own refer to cars and light vans.

9.6.3 Further analysis of the morning survey is contained within **Table 9.36**.

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Time	From Millpool Head without stopping	From Millpool Head stopping	From King Street	Into King Street	Reverse from West Street	From Fore Street
7.00-7.15	7	1	24	28		3
7.15-7.30	6	1	13	18		2
7.30-7.45	12	2	19	29	3	1
7.45-8.00	19	1	29	41	1	4
8.00-8.15	7	2	33	39		8
8.15-8.30	15	3	27	42		5
8.30-8.45	21	4	39	54	1	5
8.45-9.00	30	1	35	58		5
9.00-9.15	24	4	37	55		4
9.15-9.30	15	6	40	56		2
9.30-9.45	20	7	37	62		2
9.45-10.00	19	6	26	45		3

Table 9.36: Morning survey at Millpool Head / King Street 15 October 2009

9.6.4 A synopsis of the morning survey period is shown in **Table 9.37.**

Over the 3 hour period	In the peak hour
• 527 motor vehicles travelled along King Street	• 193 motor vehicles travelled along King Street
• 9 were heavy goods vehicles – 1.7%	• 3 were heavy goods vehicles – 1.6%
• 68% travelled away from The Parade and 32% towards The Parade	• 69% travelled away from The Parade and 31% towards The Parade
• 19% of vehicles from Millpool Head gave way to vehicles from King Street	• 26% of the vehicles from Millpool Head gave way to vehicles from King Street
• 39% of motor vehicles from King Street turned left into Millpool Head	• 37% of motor vehicles from King Street turned left into Millpool Head
• 5 vehicles reversed out of West Street	• 1 vehicle reversed out of West Street
• 15 pedal cyclists were observed	• 10 pedal cyclists were observed

Table 9.37: Millpool Head / King Street morning survey 15 October 2009 synopsis

9.6.5 The results of the afternoon survey are contained in **Table 9.38.**

	From Millpool Head				From King Street				From Fore Street		
Time	Towards West Street no stop(1)	Towards West street stop (2)	Towards King Street no stop (1)	Towards King Street stop (2)	Towards Millpool Head no stop (1)	Towards Millpool Head stop (3)	Towards West Street no stop (1)	Towards West Street stop (3)	To West Street	To Millpool Head	To King Street
3.00-3.15	7		10+1bus+1 m/c	9	14+1bus	2+1bus	17	3		1	
3.15-3.30	5		22+1p/c	3	10		11	5	2	1	
3.30-3.45	5		20+1m/c	2	8		12	4		1	1
3.45-4.00	6		18+2bus+1p /c	5	4+1p/c+ 1bus		9	4	4+2p/c		1p/c
4.00-4.15	8		27+2m/c+2p /c+1coach+1 minibus	4	11+1bus	1+1bus	11+1m/c	1			1
4.15-4.30	8	2	19	2	12+1bus	2	10+1minibus		3	1+1p/c	
4.30-4.45	7	1	33+2minibus	6	7+1minib us	1+1minib us	13	1			
4.45-5.00	6		22+2p/c	12	13	2	19+1p/c	2+1minibus	1		1p/c
5.00-5.15	10+1m/c +1p/c	5	38+1bus	16	8	1	13+2p/c	3	5	3+1p/c	
5.15-5.30	3+1m/c	4+1bus	25	1	10+1bus	1bus	12	1	2		
5.30-5.45	14+1p/c		25	7+1m/c+ 1bus	8	2	14+1minibus	2	1	2	1p/c
5.45-6.00	14	2	18+1hgv+1b us+1minibus	6+1m/c	6+1bus		23	1	2+1m/c		1

Table 9.38: Afternoon survey at Millpool Head / King Street Wednesday 14 October 2009

Key: (1) vehicles approaching the junction proceeded without stopping; (2) vehicles approaching the junction from Millpool Head stopped and gave way to vehicles turning right from King Street; (3) vehicles approaching from King Street stopped. The vehicle numbers on their own refer to cars and light vans.

9.6.6 Further analysis of the afternoon survey is contained within **Table 9.39.**

9.6.7

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Time	From Millpool Head without stopping	From Millpool Head stopping	From King Street without stopping	From King Street stopping	To King Street	From Fore Street
3.00-3.15	19	9	32	6	21	1
3.15-3.30	27	3	21	5	25	3
3.30-3.45	26	2	20	4	24	2
3.45-4.00	26	5	14	4	25	4
4.00-4.15	39	4	24	3	36	1
4.15-4.30	27	4	24	2	21	4
4.30-4.45	37	7	21	3	41	
4.45-5.00	28	12	32	5	34	1
5.00-5.15	50	21	21	4	39	8
5.15-5.30	29	6	23	2	26	2
5.30-5.45	39	9	23	4	34	3
5.45-6.00	35	9	30	1	29	4

Table 9.39: Afternoon survey at Millpool Head / The Parade 14 October 2009

9.6.8 A synopsis of the afternoon survey is contained within **Table 9.40.**

Over the 3 hour period	In the peak hour
• 683 motor vehicles passed through King Street	• 246 motor vehicles passed through King Street
• 1 was a heavy goods vehicle – 0.1%	• 0 were heavy goods vehicles – 0%
• 48% travelled away from The Parade and 52% towards The Parade	• 47% travelled away from The Parade and 53% towards The Parade
• 19% of the vehicles from Millpool Head stopped	• 17% of the vehicles from Millpool Head stopped
• 41% of motor vehicles in King Street turned left to Millpool Head	• 47% of motor vehicles In King Street turned left to Millpool Head
• 19 pedal cyclists were observed	• 7 pedal cyclists were observed

Table 9.40: Millpool Head / King Street afternoon survey 14 October 2009 synopsis

9.6.9 An assessment of available capacity has been made on the basis that within the peak hour there is a peak flow in one of the 15 minute survey periods. The highway has managed to cater for this peak flow and hence it is reasonable to assume that it could cater for this flow in the other three 15 minute periods. This provides an indication of the minimum spare capacity available.

9.6.10 The results are shown in **Tables 9.41 and 9.42.**

Time	Two-way traffic flow	Additional traffic flow
8.00-8.15	72	21
8.15-8.30	69	24
8.30-8.45	93	-
8.45-9.00	93	-
Total	327	45

Table 9.41: Available capacity morning peak hour

Time	Two-way traffic flow	Additional traffic flow
4.00-4.15	63	19
4.15-4.30	47	34
4.30-4.45	65	16
4.45-5.00	81	
Total	274	69

Table 9.42: Available capacity afternoon peak hour

Observations

9.6.11 A significant number of drivers travelling from Millpool Head stopped to allow vehicles from King Street to enter West Street. This reduces congestion in the area and demonstrates that by and large the local population act sensibly to assist one another.

9.6.12 Reversing out of West Street, due to obstruction further up the road, was observed.

Conclusions

9.6.13 The capacity analysis indicates that the maximum number of peak hour trips (15 morning / 23 afternoon) predicted to be generated by the proposed and committed development should be able to be accommodated in this area.

9.7 King Street / The Parade

9.7.1 The afternoon survey of the junction of King Street / The Parade / Workhouse Hill was undertaken on Thursday 15 October and the morning survey on Friday October 2009. The weather was fine and dry for both surveys. The purpose of the survey was to estimate the degree of conflict at the junction.

9.7.2 The results of the morning survey are contained within **Table 9.43**.

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	From King Street			From The Parade			From Workhouse Hill			
Time	To The Parade no stop (1)	To Workhouse Hill no stop (1)	To the junction give-way (2)	To King Street no stop (1)	To Workhouse Hill no stop (1)	To the junction give way (2)	To King Street no stop (1)	To The Parade no stop (1)	To the junction give way (3)	Pedestrians
7.00-7.15	2+1bus+2 p/c	1		18+1coach +2p/c		1hgv	1		1	1
7.15-7.30	3		1	13+1p/c			5			
7.30-7.45	5+1hgv+1b us+1p/c	2	2	16+1bus+ 1hgv+1m/c +1minibus		1minibus	1		3	1
7.45-8.00	7+1hgv+1l gv+2bus	2		20+3minib us		2+1reverse	3+1m/c	1	1	5
8.00-8.15	7+2bus+2 p/c	3		16+2bus+ 1p/c	1	1+1reverse			1	7
8.15-8.30	13+1hgv			21+1hgv+ 1minibus	1	1+1bus	4			3
8.30-8.45	15+1bus			16+1hgv		2	9	1	1	4
8.45-9.00	25		1	34	2	6	3	1	1	7
9.00-9.15	19+1bus+ 1minibus			26+1bus+ 1minibus		3+1reverse	3		1	11
9.15-9.30	20+2hgv+ 2bus+1min ibus+1tract or+1p/c	3		17+2bus+ 1p/c	1	1+1bus+1r everse	4		1	8
9.30-9.45	19	1		23+1hgv			2	2+1mini bus		8
9.45-10.00	17	3		22			1	1	1	7

Table 9.43: Morning survey at King Street / The Parade 16 October 2009

Key: (1) vehicles approaching the junction passed through without stopping; (2) vehicles approaching the junction from King Street or the Parade gave way; (3) vehicles approaching the junction from Workhouse Hill gave priority to other vehicles. The vehicle numbers on their own refer to cars and light vans.

9.7.3 Further analysis of the morning survey is contained within **Table 9.44**.

Time	Total with no conflict from King Street	Total from King Street giving way	Total with no conflict from The Parade	Total from The Parade giving way	Total with no conflict	Total giving way	Total on Workhouse Hill	Pedestrians in King Street at the junction
7.00-7.15	4		19	1			3	1
7.15-7.30	3	1	13				5	
7.30-7.45	9	2	20	1			6	1
7.45-8.00	13		23	3			8	5
8.00-8.15	12		19	2			5	7
8.15-8.30	14		24	2			5	3
8.30-8.45	16		17	2			11	4
8.45-9.00	25	1	36	6			7	7
9.00-9.15	21		28	4			4	11
9.15-9.30	29		20	3			9	8
9.30-9.45	20		24	2			6	8
9.45-10.00	20		22	1			6	7

Table 9.44: Morning survey at King Street / The Parade 16 October 2009

9.7.4 A synopsis of the morning survey period is shown in **Table 9.45**.

Over the 3 hour period	In the peak hour
• 516 motor vehicles passed through King Street	• 190 motor vehicles passed through King Street
• 9 were heavy goods vehicles – 1.7%	• 4 were heavy goods vehicles – 2.1%
• 63% travelled away from The Parade and 37% towards The Parade	• 64% travelled away from The Parade and 36% towards The Parade
• 5.6% of vehicles gave way on the corner	• 6.8% of vehicles gave way on the corner
• 10 pedal cyclists were observed	• 2 pedal cyclists were observed
• 62 pedestrians walked through the narrow section of King Street at the junction	• 21 pedestrians walked through the narrow section of King Street at the junction

Table 9.45: King Street / The Parade morning survey 16 October 2009 synopsis

9.7.5 The results of the afternoon survey are contained in **Table 9.46**.

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	From King Street			From The Parade			From Workhouse Hill			
Time	To The Parade no stop (1)	To Workhouse Hill no stop (1)	To the junction give-way (2)	To King Street no stop (1)	To Workhouse Hill no stop (1)	To the junction give way (2)	To King Street no stop (1)	To The Parade no stop (1)	To the junction give way (3)	Pedestrians
3 00-3 15	14+1p/c	1		18		4+bus	4	1	1	9
3 15-3 30	29+1bus+ 2m/c+2p/c		1	19+1bus+ 2m/c		5	1	3	1	7
3 30-3 45	20+1p/c	3		11+1p/c		2	1		1	12
3 45-4 00	25+1bus+ 1m/c+3p/c	1	2	12+1bus	1	5	2	1		3
4 00-4 15	25	2		18+3bus+ 4p/c	1	5	1		2	10
4 15-4 30	28+3p/c	1	1bus	22+1m/c+ 1p/c		1	1	1		7
4 30-4 45	26	4		20+2bus			4	2	3	14
4 45-5 00	18+1bus+ 1coach	4	1	20+1bus+ 3m/c	1	3	2			8
5 00-5 15	31+1m/c	2		20+1m/c	1	2				7
5 15-5 30	30+1lgv	5		26+1bus	1	1	1	2		3
5 30-5 45	30+1bus+ 1m/c	2	1	19+2m/c	1		2	2	1	1
5 45-6 00	35+1bus+ 3m/c+1p/c +1minibus	2m/c		23+1bus+ 2p/c+1mini bus		1+bus	2		2	5

Table 9.46: Afternoon survey at King Street / The Parade 15 October 2009

Key: (1) vehicles approaching the junction passed through without stopping; (2) vehicles approaching the junction from King Street or the Parade gave way; (3) vehicles approaching the junction from Workhouse Hill gave priority to other vehicles. The vehicle numbers on their own refer to cars and light vans.

9.7.6 Further analysis of the afternoon survey is contained within **Table 9.47**.

Time	Total with no conflict from King Street	Total from King Street giving way	Total with no conflict from The Parade	Total from The Parade giving way	Total with no conflict	Total giving way	Total on Workhouse Hill	Pedestrians in King Street at the junction
3.00-3.15	15		18	5			7	9
3.15-3.30	32	1	22	5			5	7
3.30-3.45	23		11	2			5	12
3.45-4.00	28	2	14	5			5	3
4.00-4.15	27		22	5			6	10
4.15-4.30	29	1	23	1			3	7
4.30-4.45	30		22				13	14
4.45-5.00	24	1	25	3			7	8
5.00-5.15	34		22	2			3	7
5.15-5.30	36		28	1			9	3
5.30-5.45	34	1	22				8	1
5.45-6.00	42		25	2			6	5

Table 9.47: Afternoon survey at King Street / The Parade 15 October 2009

9.7.7 A synopsis of the afternoon survey is contained within **Table 9.48.**

Over the 3 hour period	In the peak hour
• 662 vehicles passed through King Street	• 232 vehicles passed through King Street
• 0 were heavy goods vehicles – 0%	• 0 were heavy goods vehicles – 0%
• 46% travelled away from The Parade and 54% towards The Parade	• 52% travelled away from The Parade and 48% towards The Parade
• 5.5% of vehicles gave way on the corner	• 4.7% of the vehicles gave way on the corner
• 19 pedal cyclists were observed	• 8 pedal cyclists were observed
• 86 pedestrians walked through the narrow section of King Street at the junction	• 39 pedestrians walked through the narrow section of King Street at the junction

Table 9.48: King Street / The Parade afternoon survey 14 October 2009 synopsis

9.7.8 An assessment of available capacity has been made on the basis that within the peak hour there is a peak flow in one of the 15 minute survey periods. The highway has managed to cater for this peak flow and hence it is reasonable to assume that it could cater for this flow in the other three 15 minute periods. This provides an indication of the minimum spare capacity available.

9.7.9 The results are shown in **Tables 9.49 and 9.50.**

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Time	Two-way traffic flow	Additional traffic flow
8.00-8.15	33	26
8.15-8.30	43	16
8.30-8.45	45	14
8.45-9.00	59	
Total	180	56

Table 9.49: Available capacity morning peak hour

Time	Two-way traffic flow	Additional traffic flow
4.00-4.15	56	2
4.15-4.30	55	3
4.30-4.45	58	
4.45-5.00	57	1
Total	226	6

Table 9.50: Available capacity afternoon peak hour

Observations

9.7.10 No significant queuing or delay was observed.

Conclusions

9.7.11 The capacity analysis indicates that there would be adequate capacity in the morning for the predicted 15 trips. While the afternoon analysis indicates a possible shortfall, in the following hour peak 15 minute flows in excess of 60 were observed and hence there should be sufficient capacity to cater for the proposed development.

9.8 St John

9.8.1 A survey of the junction of St John's Road with Blindwell Hill was undertaken on Friday 9 October 2009. The weather was overcast and wet. The purpose of the survey was to identify the volume of traffic heading to and from St John from the Insworke/Southdown end of the village.

9.8.2 The morning survey results are shown in **Table 9.51.**

Time	From St John to Blindwell Hill	From St John to St John's Road	To St John from Blindwell Hill	To St John from St John's Road	From Blindwell Hill to St John's Road	To Blindwell Hill from St John's Road
7 00-7 15						
7 15-7 30		1	1	1		
7 30-7 45		m/c		6		
7 45-8 00	1	3		10		
8 00-8 15		2	2	7		1
8 15-8 30		1		6		
8 30-8 45		1		4		1
8 45-9 00		hgv		6	1	2
9 00-9 15		1	1	5	2	
9 15-9 30	1			4 + m/c		
9 30-9 45	1			5		
9 45-10 00		2		7	1	

Table 9.51: Morning survey at St John's Road / Blindwell Hill Friday 9 October 2009

Key: Numbers are cars and light vans unless otherwise indicated

9.8.3 A synopsis of the morning survey period is shown in **Table 9.52.**

Over the 3 hour period	In the peak hour
• 82 motor vehicles travelled on the road to St John • 80% to St John, 20 from St John • 91% used St John's Road, 9% Blindwell Hill • 1 heavy goods vehicle was observed – 2% • 0 pedal cyclists were observed	• 30 motor vehicles travelled on the road to St John • 83% to St John, 17% from St John • 93% used St John's Road, 7% Blindwell Hill • 1 heavy goods vehicle observed – 3% • 0 pedal cyclists were observed

Table 9.52: St Johns Road morning survey 9 October 2009 synopsis

9.8.4 The results of the afternoon survey are shown in **Table 9.53.**

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Time	From St John to Blindwell Hill	From St John to St John's Road	To St John from Blindwell Hill	To St John from St John's Road	From Blindwell Hill to St John's Road	To Blindwell Hill from St John's Road
3.00-3.15		3, 2 m/c, 1 p/c	1	4	3	
3.15-3.30	1	5		1, 1 m/c	2	
3.30-345		5	1	2		
3.45-4.00		1		2, 2 m/c		
4.00-4.15	1	4		2	1	
4.15-4.30	2	2, 1 m/c		3		
4.30-4.45		3		2		
4.45-5.00	1	3		1, 1 m/c		
5.00-5.15	1	2		5	1	
5.15-5.30		6, 1 m/c	2	3		
5.30-5.45	3	1	1	4		
5.45-6.00	3	4		1, 1 m/c		

Table 9.53: Afternoon survey at St John's Road / Blindwell Hill Friday 9 October 2009

Key: Numbers are cars and light vans unless otherwise indicated

9.8.5 A synopsis of the afternoon survey is contained in **Table 9.54**.

Over the 3 hour period	In the peak hour
• 95 motor vehicles travelled on the road to St John	• 26 motor vehicles travelled on the road to St John
• 58% towards St John, 42% away from St John	• 35% towards St John, 65% away from St John
• 82% used St John's Road, 18% Blindwell Hill	• 85% used St John's Road, 15% Blindwell Hill
• 0 heavy goods vehicles were observed	• 0 heavy goods vehicles were observed
• 1 pedal cyclist was observed	• 0 pedal cyclist were observed

Table 9.54: St John's Road / Blindwell Hill afternoon survey 9 October 2009 synopsis

Capacity analysis

9.8.6 It is not possible to make a reliable prediction of the capacity of the road to and through St John.

9.8.7 The survey at the junction of Southdown Road with Parsons Court indicates that the comparable flows at peak hours are as shown in **Table 9.55.**

Time	Southdown Road east of Parsons Court	Parsons Court	Parsons Court % of Southdown Road
8.00-9.00	93	10	11%
4.00-5.00	101	16	16%

Table 9.55: Peak hour flows at Parsons Court junction

9.8.8 As a worst case and assuming that all of the existing traffic to and from the Insworke/Southdown direction on the road towards St John emanated from either Parsons Court or Insworke/Southdown to the east of Parsons Close the peak hour contributions from Parsons Court would be 28 x 11% = 3 vehicles in the morning and 22 x 16% = 4 vehicles in the afternoon.

9.8.9 This calculation does not take into account the fact that 32% of the Insworke/Southdown housing area lies between Parsons Court and the mini-roundabout. Given that the area to the east of Parsons Court also contains the boatyards and marinas it is reasonable to reduce the above figures by say 20% to 2 vehicles in the morning and 3 vehicles in the evening peak hours being associated with Parsons Court. This leads to the prediction that the 37 dwellings in the committed and proposed developments could generate 4 and 5 additional trips through St John in the morning and evening peak hours respectively.

9.8.10 These should be considered as the absolute maximum additional traffic that the proposed developments will contribute to the route through St John because the reality is that the flow does not solely come from Insworke/Southdown but from other parts of the village as well and hence the above percentages will be much lower. In addition, it is reasonable to assume that all of the trips from the new developments will not all be new trips, therefore some of the additional above are likely to be already on the network.

Observations

9.8.11 The surveys revealed that the peak flow on the road to St John is around 1 vehicle every 2 minutes.

Conclusion

9.8.12 It is concluded that the proposed developments may add a small number of vehicle movements to the route through St John.

9.9 Survey verification

9.9.1 The surveys were undertaken on different days and to verify that none of these days had particularly high or low flows a check has been undertaken where possible.

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Hounster Hill - West Street / Radford Lane

Date	Survey location	3 hour Am	Peak hour AM	3 hour PM	Peak hour PM
Monday 12 October	West Street / Radford Lane	613	221	760	297
Thursday 15 October	Hounster Hill	639	251		
Wednesday 14 October	Hounster Hill			763	269

Table 9.52: Comparison of flows on Hounster Hill

West Street / Radford Lane – West Street / Dodbrook

Date	Survey location	3 hour Am	Peak hour AM	3 hour PM	Peak hour PM
Monday 12 October	West Street / Radford Lane	629	233	757	316
Tuesday 13 October	West Street / Dodbrook	711	273	835	301

Table 9.53: Comparison of flows in West Street (W)

Millpool Head / King Street – King Street / The Parade

Date	Survey location	3 hour Am	Peak hour AM	3 hour PM	Peak hour PM
Thursday 15 October	Millpool Head / King Street	527	193		
Wednesday 14 October	Millpool Head / King Street			683	246
Friday 16 October	King Street / The Parade	516	190		
Thursday 15 October	King Street / The Parade			662	232

Table 9.54: Comparison of flows in King Street

Conclusion

9.9.2 The peak hour flows are reasonably coincident, indicating that the surveys were not affected by one-off external circumstances

9.10 Peak hour traffic flows across the network

9.10.1 For completeness the peak hour traffic flows on all roads surveyed are shown in **Table 9.55.**

Road	Day	Date	AM peak hour	PM peak hour
Blindwell Hill at St John's Road	Friday	9	7	4
Dodbrook at Manor Farm	Thursday	8	156	271
Hounster Drive	Monday Tuesday	12 13	14	16
Hounster Hill	Wednesday Thursday	14 15	231	269
King Street at Millpool Head	Wednesday Thursday	14 15	193	246
King Street at The Parade	Thursday Friday	15 16	190	232
Millpool Head at King Street	Wednesday Thursday	14 15	136	211
Parsons Court	Friday	9	9	16
Radford Lane	Monday	12	26	28
St Andrew's Street east of Hounster Drive	Monday Tuesday	12 13	23	26
St John's Road at Blindwell Hill	Friday	9	33	23
Southdown Road west of Parsons Court	Friday	9	112	129
The Parade at King Street	Thursday Friday	15 16	176	204
West Street between Dodbrook and Radford Lane	Monday	12	233	316
West Street between Dodbrook and Radford Lane	Tuesday	13	273	301
Workhouse Hill at King Street	Thursday Friday	15 16	28	30

Table 9.55: Peak hour traffic flows across the network on survey days in October 2009

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10 Mitigation

10.1.1 The most significant measures of mitigation would be to attempt to ensure that:

- The proposed properties are occupied by persons already resident within the village, and
- The properties vacated by the residents of the proposed developments are subsequently re-occupied by other existing residents of the village.

10.1.2 It is understood that the former should be the case and that Devon & Cornwall housing will be seeking to come to an understanding with other bodies responsible for public housing on the latter.

10.1.3 Where the new residents move out of privately rented accommodation there can be no control.

10.1.4 The Study has identified that the major impact, in terms of traffic flow, of the proposed development and the committed development will be on the section of Southdown Road between Parsons Court and the mini-roundabout at the end of the New Road.

10.1.5 The Study has identified that consideration needs to be given to the pedestrian access to the recreation ground along this length of road. The boundary hedge requires trimming to maintain visibility.

10.1.6 The Study confirms the view of the Parish Council that the verge between Parsons Court and the recreation ground should be made up as footway in order to facilitate and promote walking as a preferred mode of travel.

10.1.7 The Study has identified that the route between the proposed development is virtually level and hence suitable for cycling. It is suggested that the Parish Council consider where additional cycle racks could be provided in close proximity to the retail area, possibly within the Tanyard.

10.1.8 The existing bus services clearly have adequate capacity for the residents of the proposed development. A Welcome Pack, to be provided to all new residents should identify the opportunities afforded by public transport.

10.1.9 The generally poor horizontal and vertical alignment of the roads within the area results in large vehicles having a disproportionate impact. It is suggested that in order to prevent congestion during the morning commuting period the Construction Management Plan considers a restriction on the delivery of material to the site prior to 9am.

11 Conclusions

11.1.1 Using survey data from the adjoining Parsons Court development and other traffic and census data, the maximum combined peak time two-way vehicular traffic flow from the proposed development and the committed development off Insworke Close, that will travel beyond the village boundary, is confidently predicted to be no more than 15 vehicles in the morning peak hour and 23 vehicles per hour.

11.1.2 This figure will not be reached if incoming residents of the new properties are already resident in Millbrook and the properties they vacate are filled by other existing residents.

11.1.3 The maximum flow will travel on the length of Southdown Road between Parsons Court and the mini-roundabout junction with St John's Road. Beyond this junction the traffic will begin to disperse onto the various routes out of the village.

11.1.4 While it is not possible to be certain which routes will be favoured the location of the developments combined with the surveyed traffic flow data suggests that a small number may use the route through St John, a very small number may use the route via St Andrew's Street and the remainder would use Dodbrook, West Street and Hounster Hill, together with potentially some via Anderton to Cremyll.

11.1.5 An analysis of the spare capacity of the various routes demonstrates that the major routes should be capable of carrying the whole of the development traffic should it decide to travel that way and that all routes should be capable of carrying a realistic share of the traffic.

11.1.6 This analysis has been undertaken using data from Traffic surveys undertaken in October 2009. During this period the morning peak hour traffic flows are likely to be at their highest with maximum attendance at school and work and minimum interference from adverse weather conditions. This period is considered to be the most critical of the day because of the need to rely on a 'guaranteed' journey time to arrive at school or work at a set time. Seasonal variations are likely to show a reduction rather than an increase in the level of flow measured. During the afternoon peak period it is possible that during holiday periods a reduction due to residents being on holiday may be equalled or exceeded by the added flow of visitors to the coastal villages or Mount Edgcumbe. This variation is impossible to predict, will vary daily and is of significantly less important than the critical timing situation of the morning peak. The Study is therefore considered to have been undertaken in the correct manner.

11.1.7 An analysis of the recent record of collisions on the highway resulting in personal injury reveals that there are no clusters of accidents within the village that might give cause for concern should traffic flows increase. Externally, the route through St John has a poor record in relation to the volume of traffic carried.

11.1.8 In terms of sustainability, the village as a whole has a good bus frequency, however from the point of view of the journey to and from work it is not particularly convenient, certainly for destinations other than Plymouth City Centre. This places a reliance on the use of the car for many journeys which, according to census data is tempered by the high percentage of employees reported as working from home or within the village. The site of the proposed development is well placed to make use of the bus service that is available.

11.1.9 The site is also reasonably well placed in respect of access on foot or cycle to the wide range of local facilities on offer, including health and primary education.

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11.1.10 The need has been identified for a short length of footway to be provided along Southdown Road between the junction of Parsons Court and the recreation ground.

11.1.11 A survey of the adjoining Parsons Court development confirms that the proposed car parking ratio should be sufficient.

11.1.12 The greatest impact of the proposed development is likely to be that created by the delivery of construction materials. It is suggested that the Construction Management Plan considers a restriction on the delivery of material to site prior to 9am.

11.1.13 The overall conclusion is that the proposed developments are manageable in transport terms and clearly any potential impact will be minimised if the number of new residents to the village is also minimised.

Appendix Figures

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External Access Routes

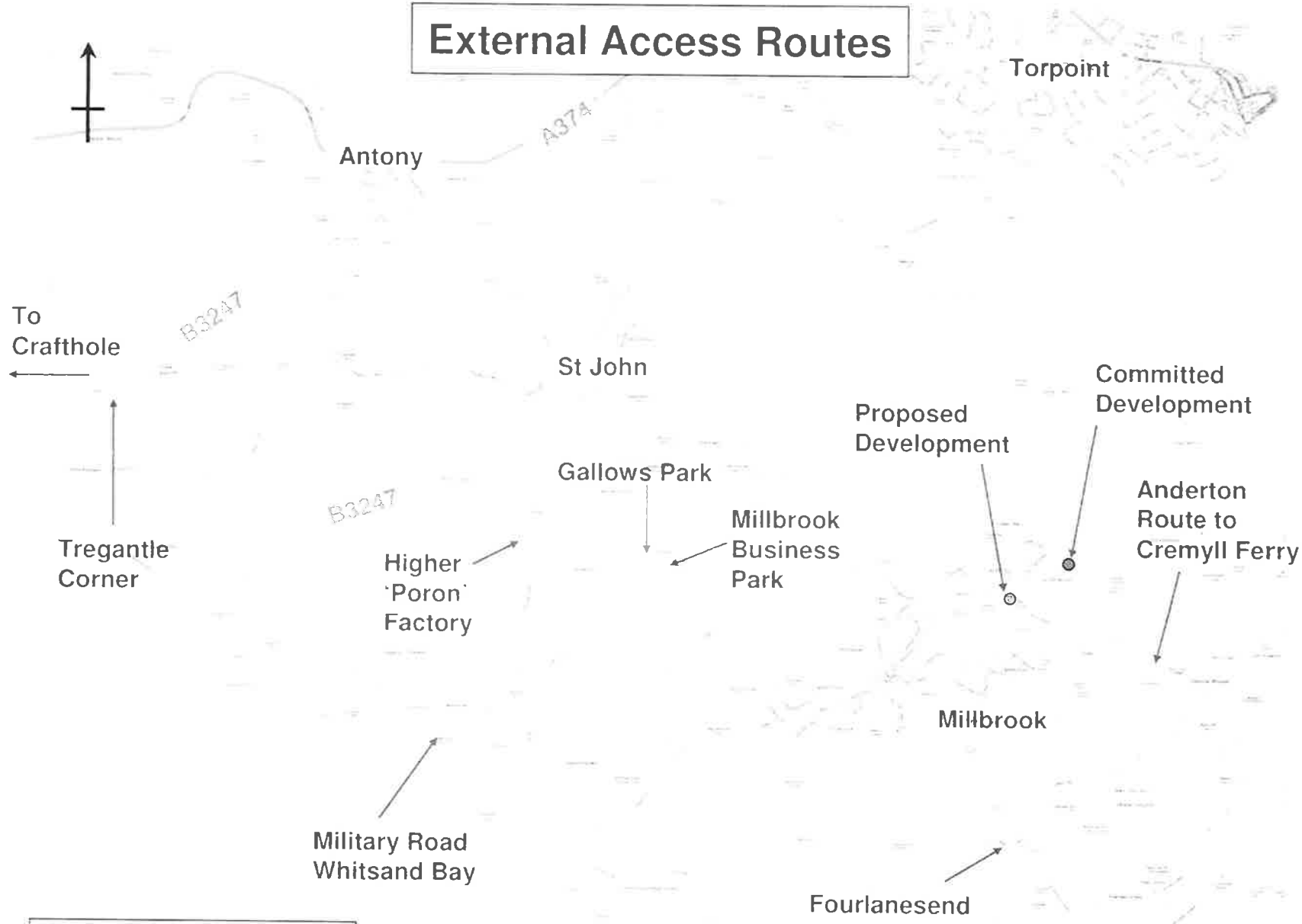

Figure A.1

Site Location

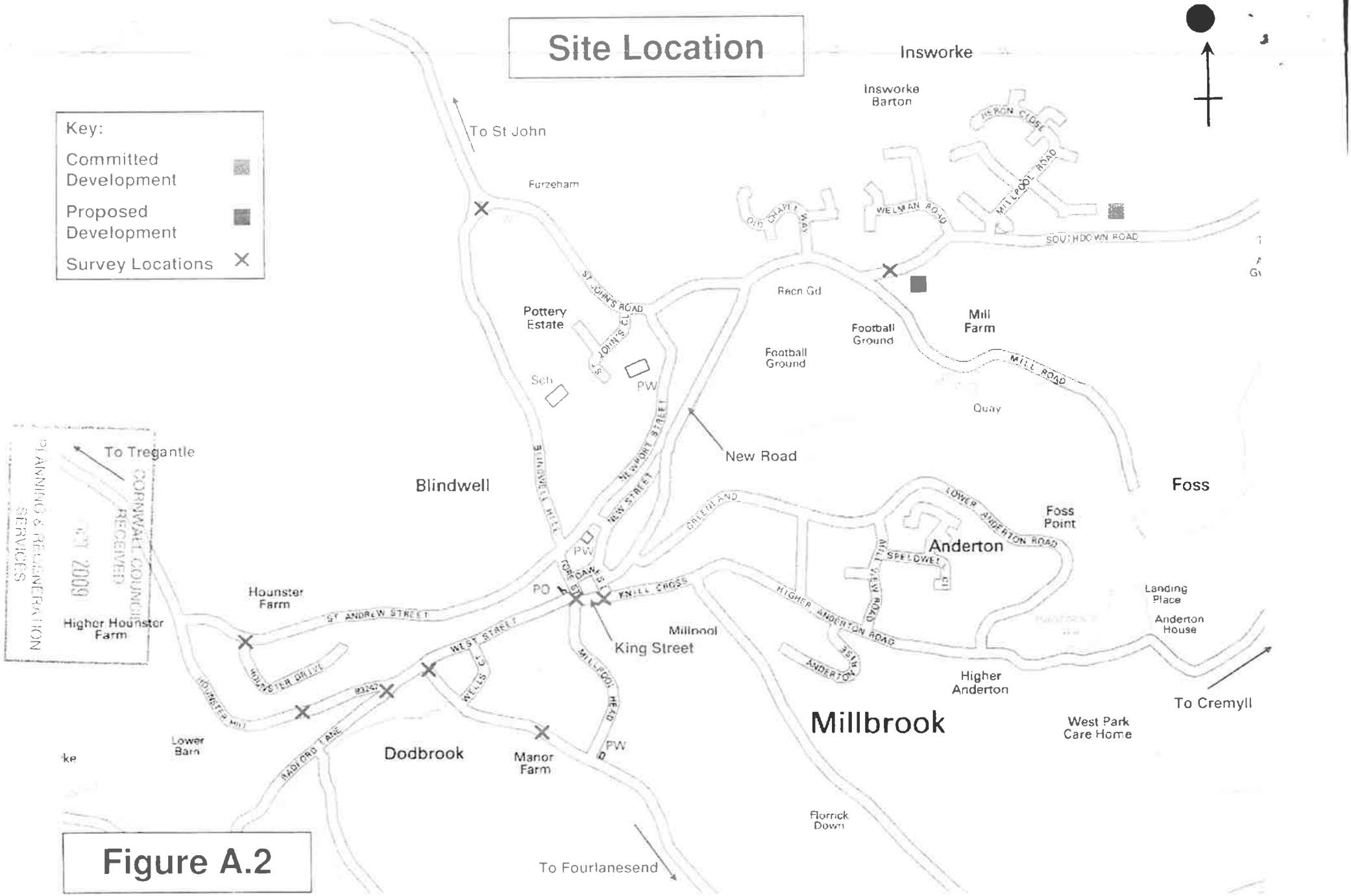

Figure A.2

Site Plan

MILLBROOK - PHASE 2

PRELIMINARY

SKETCH LAYOUT

09722 - SD01C

Figure A.3

ADG